Centre for Community Child Health

Beyond the silver bullet….

How can we combine precision policy and “stacked” interventions to drive equitable systems for children?

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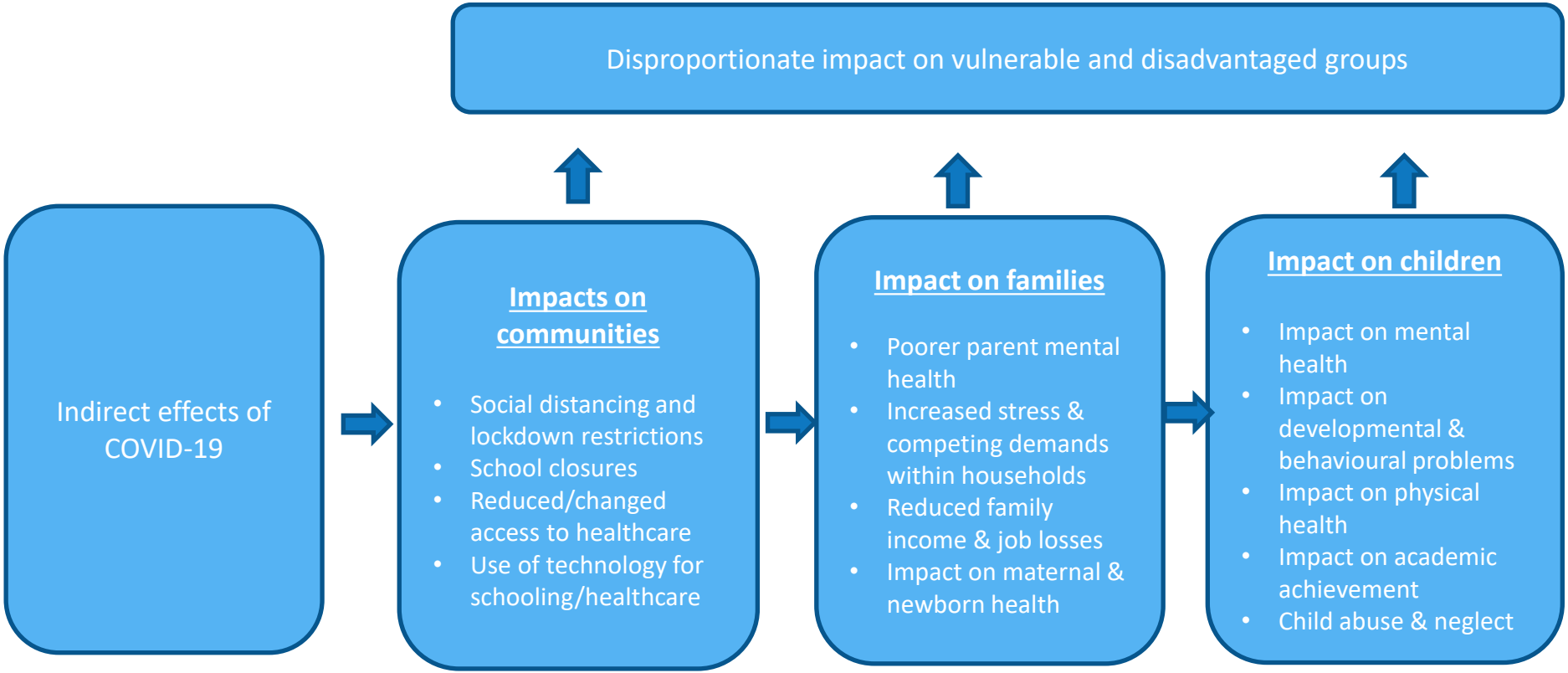
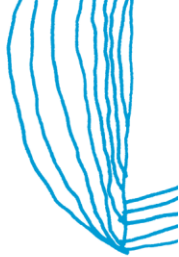
CORONA
VIRUS
SUCKS


Disproportionate impact on vulnerable and disadvantaged groups
Indirect effects of COVID-19
Impacts on communities
Social distancing and lockdown restrictions
School closures
Reduced/changed access to healthcare
Use of technology for schooling/healthcare
Impact on families
Poorer parent mental health
Increased stress & competing demands within households
Reduced family income & job losses
Impact on maternal & newborn health
Impact on children
Impact on mental health
Impact on developmental & behavioural problems
Impact on physical health
Impact on academic achievement
Child abuse & neglect

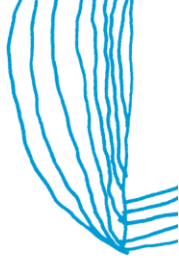


Can we “Build it back better/fairer” in a post COVID world


Silver Bullet
Just Ahead


Russell Hobbs
25:00
Soup
Pudding
Curry
Sauté
Pot Roast
White Rice
Brown Rice
Risotto
Steam
Slow Cook
Adjust
Delay Start
Manual
Keep Warm /Cancel

Make bold decisions



1. Conceptual overview

Precision policy

Table 1. Examples of Research Questions that Need Addressing in the Next Phase of Child Inequity Research

Research area	Specific topics/questions
Defining priorities	How should inequities be defined? Which inequalities are just and acceptable and which are not; and which inequalities are modifiable?
	How should we prioritize addressing inequities across different child outcomes and contexts?
Intervention targets	Of the multiple potential or known modifiable leverage points for intervention, which have the greatest potential to reduce inequities in children's outcomes?
Combinations of strategies	Given that interventions may be most effective when they are multi-pronged and reinforced over time, which intervention combinations will have the greatest impact?
	What combinations of supports across settings (e.g., school, home, and built environment) are most effective?
Timing and dosage of strategies	At which point in development, and at what dosage, would identified combinations of interventions achieve the greatest gain in child outcomes?
Populations of children to target	Which delivery approach/s are likely to have the greatest impact on reducing inequities in children's outcomes (e.g., universal, targeted)?
	Which subpopulations might benefit most from targeted strategies?
	How do the effects of interventions vary for children from different population groups, or for children who differ on a relevant determinant (e.g., different levels of parent education)?
Outcomes impacted	For the above, in what specific domain/s of child development is there an effect?

Goldfeld S, Gray S, Azpitarte F, Cloney D, Mensah F, Redmond G, Williams K, Woolfenden S, O'Connor M. Driving precision policy responses to child health and developmental inequities. Health Equity 2019;3(1):489-494.

Reducing Inequality Through Dynamic Complementarity: Evidence from Head Start and Public School Spending

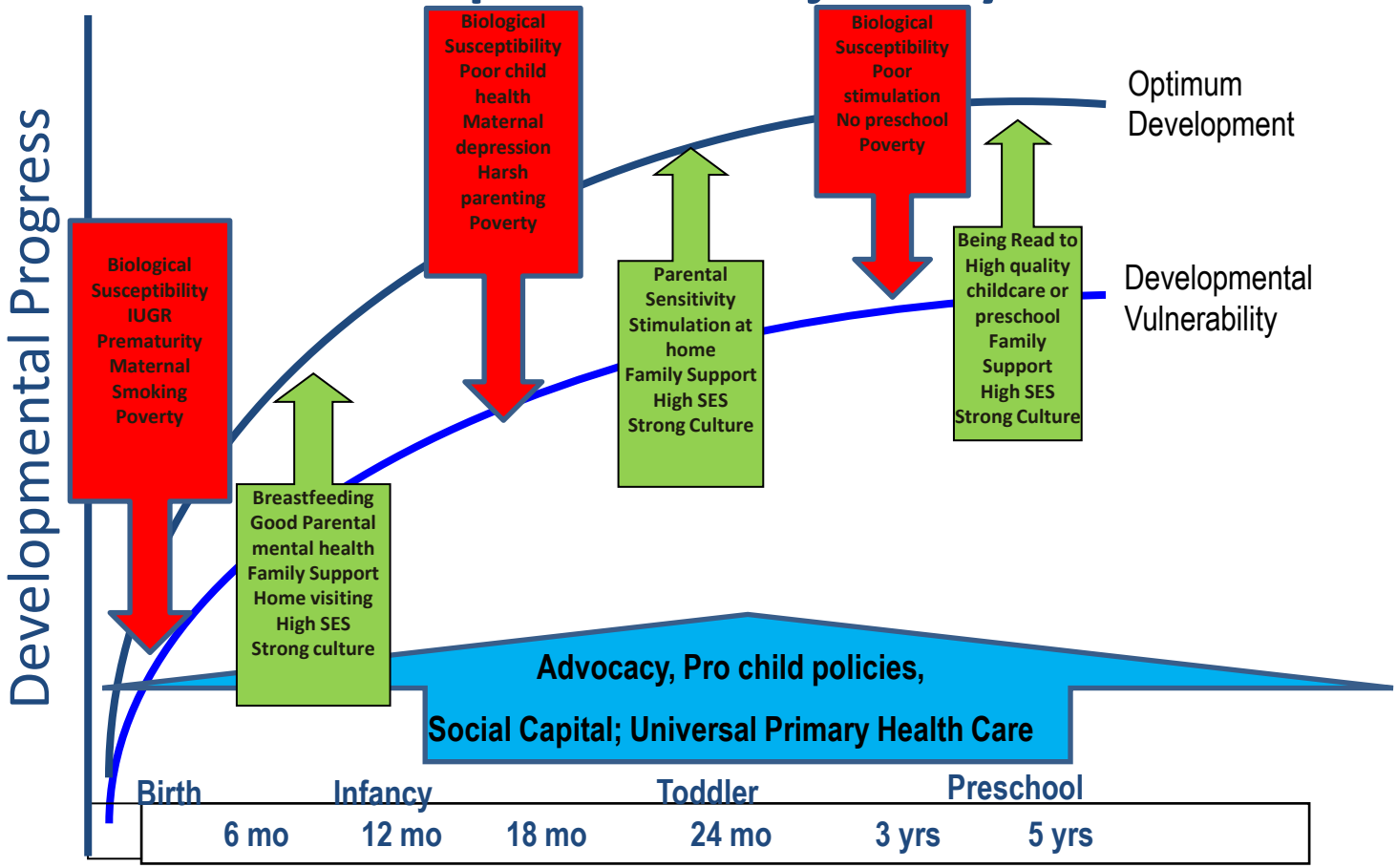
Rucker C. Johnson & C. Kirabo Jackson

Dynamic complementarity

For families living in adversity it may be that the mutual benefit of both continuity and complementarity of services will be necessary to promote human capital.

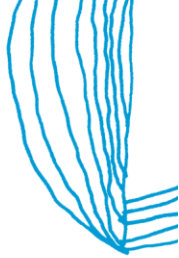
Heckman JJ, Mosso S. The economics of human development and social mobility. Annual Review of Economics 2014;6(1):689-733

Developmental Trajectory



Woolfenden S, Goldfeld S, Raman S, Eapen V, Kemp L, Williams K. Inequity in child health: The importance of early childhood development (Viewpoint). Journal of Paediatrics and Child Health 2013;49: E365-E369

2. Potential methods



Stacking existing services

murdoch children's research institute

Social Ventures Australia
Funding • Investment • Advice

BAIN & COMPANY

RESTACKING THE ODDS

Restacking the Odds: Lead indicators for equitable ECD system change

RESTACKING THE ODDS

Our work is pioneering a new way to assess and improve service performance for five strategies delivered within communities

Five key areas (antenatal to school)

We are focusing on 5 fundamental strategies, which global and local research has proven are effective in improving child development

Continuous platforms

- Antenatal Care
- Early years of school
- Early childhood education & Care

Complementary programs

- Sustained nurse home visiting
- Parenting programs

Lead indicators (evidence-based)

We have developed measureable, evidence-based lead indicators for effective delivery of each strategy - across quality, quantity and participation

- **Quality** of service
- **Quantity** available
- **Participation** rates

Priorities (within and across communities)

In selected communities across Australia, we are building an empirical view of how the strategies are performing, relative to the indicators

System response (policies, funding, sharing)

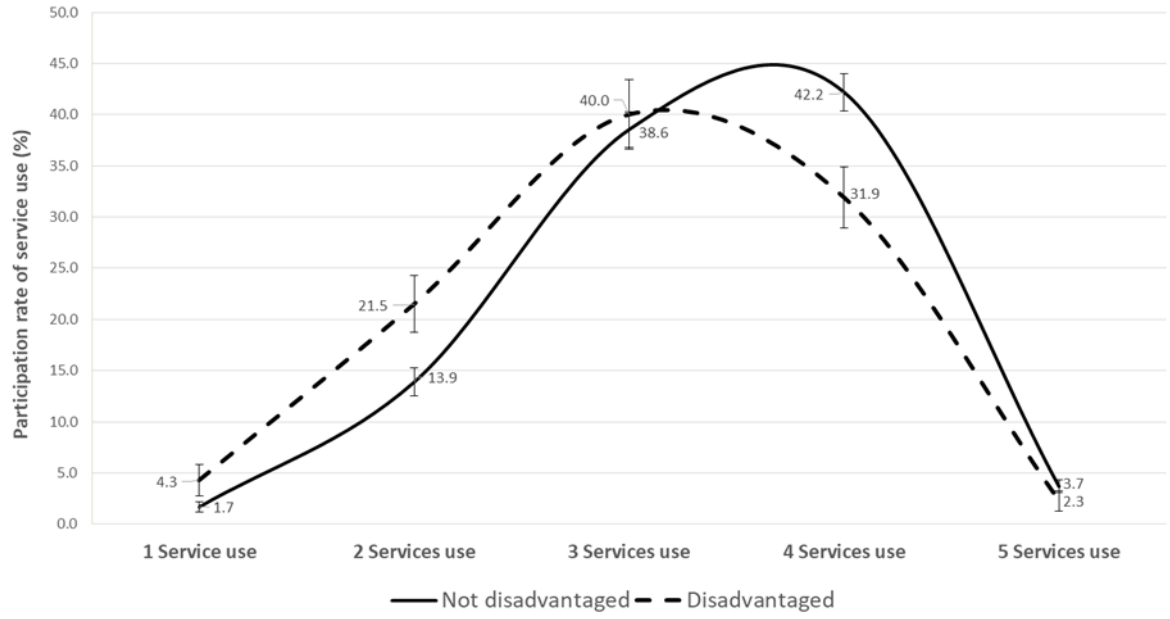
We will use our framework and findings to influence key players to change their actions, leading to better developmental outcomes

- Healthcare providers
- Community groups
- Government
- Government bodies
- Schools
- Other

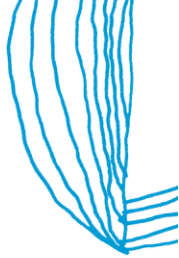
Enabling the system to set the right priorities and take the best actions

- Policies
- Accreditation standards
- Funding & resources
- Program delivery
- Data capture
- Other

Participation rate of total service use



The potential of 'stacking' early childhood interventions to reduce inequities in learning outcomes: evidence from analysis of longitudinal data.
Molloy et al. JECH 2019
Data Source: Longitudinal Study of Australian Children



Causal inference: modelling stacked interventions/policies

Reducing inequities in children's reading skills

- Children from disadvantaged families have a higher risk of poor literacy outcomes (UNICEF, 2018). Failing to support children to reach their learning potential "penalizes a child for life" (OECD, 2010)

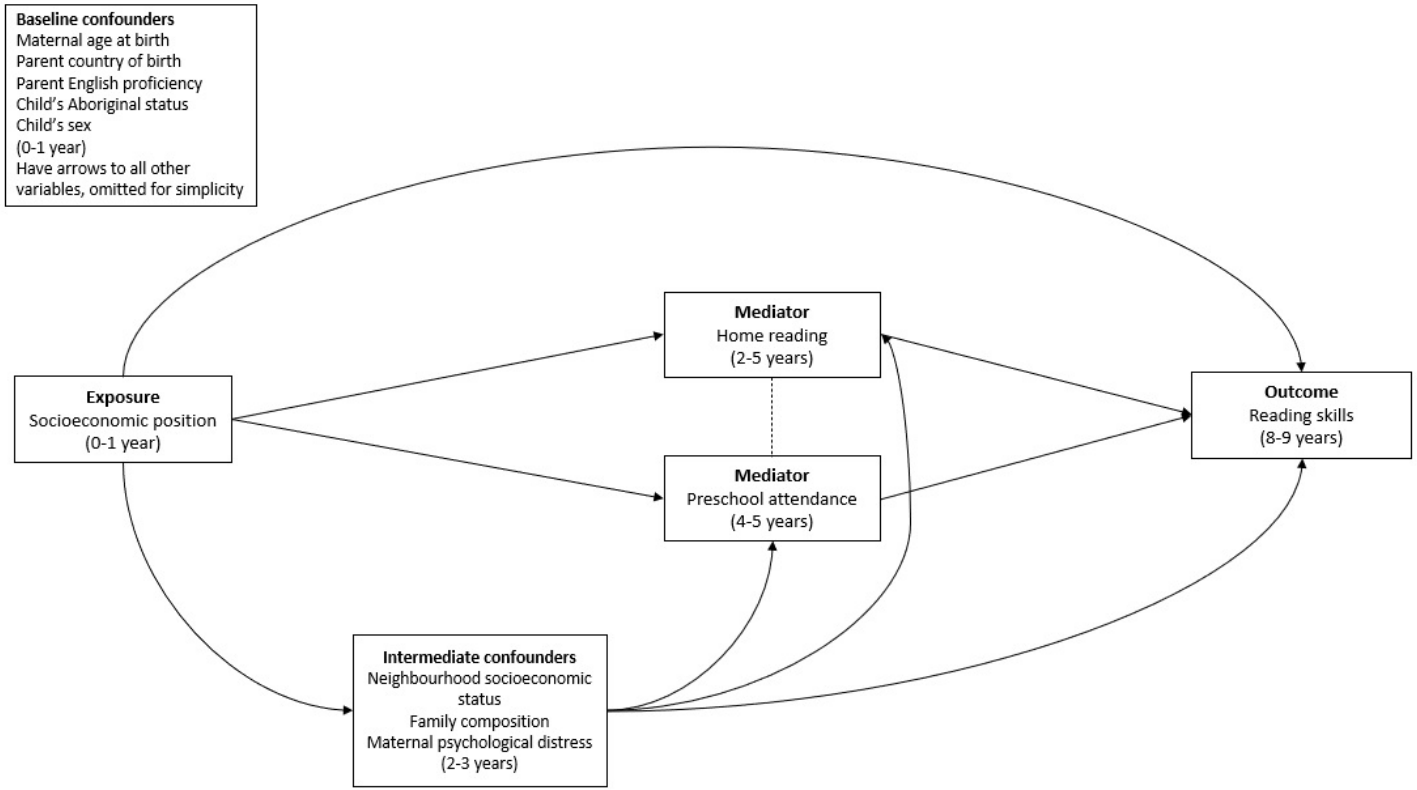
- Policy opportunities to reduce the gap in literacy outcomes:
  - Home reading (Shahaeian et al., 2018) e.g. Home Interaction Program for Parents and Youngsters (AUS), Peers Early Education Partnership (UK), Reach Out and Read (US)
  - Preschool attendance (Duncan & Sojourner, 2013)

- How do such early childhood policy opportunities operate together as potentially complementary and mutually reinforcing strategies?

- Aim to examine the potential to reduce socioeconomic gaps in children's reading skills through increasing home reading and preschool attendance amongst disadvantaged children

Goldfeld S, Moreno-Betancur M, Guo S, Mensah F, O'Connor E, Gray S, Chong S, Woolfenden S, Williams K, Kvalsvig A, Badland H, Azpitarte F & O'Connor M. Inequities in children's reading skills: The role of home reading and preschool attendance. *Academic Pediatrics*. April 2021. doi:https://doi.org/10.1016/j.acap.2021.04.019

Conceptual Model



Analytic approach

- The interventional effects approach to causal mediation analysis (Moreno-Betancur et al, 2021)
- First, estimated the average difference in prevalence of poor reading skills at 8-9 years, for children who were ‘disadvantaged’ versus ‘not disadvantaged’ at 0-1 year
  - i.e. the socioeconomic gap in reading skills we wish to eliminate
- Second, estimate the proportion of the socioeconomic gap in poor reading skills that would be eliminated by hypothetical interventions that:
  1. Increase levels of home reading amongst disadvantaged children
  2. Increase levels of preschool attendance amongst disadvantaged children
  3. Increase levels of both home reading an preschool attendance amongst disadvantaged children
- In each instance, levels are increased to be the same as those as for children from non-disadvantaged families

Moreno-Betancur M, Moran P, Becker D, Patton GC, Carlin JB. Mediation effects that emulate a target randomised trial: Simulation-based evaluation of ill-defined interventions on multiple mediators. *Statistical Methods in Medical Research*. March 2021. doi:10.1177/0962280221998409

Results

Effect	Estimate (%)	95% CI	P-value	Proportion of total risk difference (%)
Total adjusted marginal risk difference	20.1	(16.0; 24.2)	<0.01	100.0
Risk reduction from intervening on home reading	1.3	(0.3; 2.3)	0.01	6.5
Risk reduction from intervening on preschool attendance	0.4	(-0.2; 1.0)	0.16	2.1
Remaining inequities	18.3	(14.0; 22.7)	<0.01	91.4

- After considering these two interventions in combination, 91.4% of the socioeconomic gap in reading skills would remain
- That is, disadvantaged children would still have an 18.3% higher prevalence of poor reading outcomes

Dynamic complementarity: stacking interventions through RCT's

Early childhood and dynamic complementarity

Dynamic complementarity suggests that early skills investments will synergistically complement later interventions to produce greater developmental gains.

However, empirical evidence is limited.

- Think longitudinally, not vertically (multi-level interventions).
- Early, continuous, sustainable, efficient investment.
- Can this address the equity gap?
- Can this be cost-effective?

The opportunity and the research question

Can nurse home visiting (NHV, 0-2 years) combined with high-quality early childhood education and care (ECEC, 3-4 years) further boost outcomes?

- Do children's learning and development at age 4 years differ between groups?
- Separate and combined effects in a prospective study.

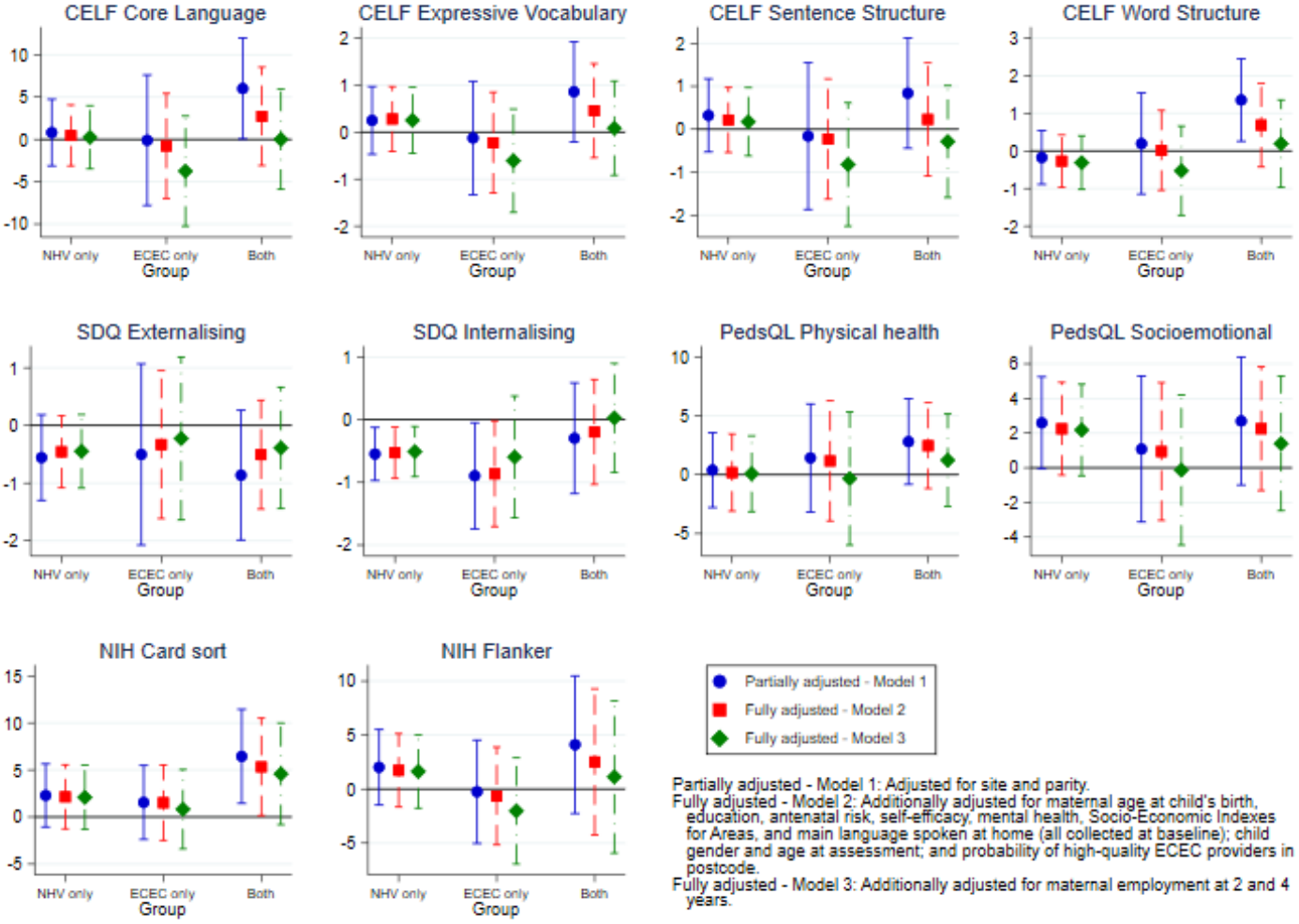
Secondary analysis of data from right@home, Australia's largest trial of NHV.

- Factorial study design comparing NHV only, ECEC only, and both SNVH + ECEC against receiving neither program.
- Data joined with ECEC rating data from the Australian Children's Education and Care Quality Authority (ACECQA).

Analysis.

- Linear and logistic regression, effect modification.
- Multiple imputation analysis and Inverse Probability Weighting for missing data.

Results



Partially adjusted - Model 1: Adjusted for site and parity.
Fully adjusted - Model 2: Additionally adjusted for maternal age at child's birth, education, antenatal risk, self-efficacy, mental health, Socio-Economic Indexes for Areas, and main language spoken at home (all collected at baseline); child gender and age at assessment; and probability of high-quality ECEC providers in postcode.
Fully adjusted - Model 3: Additionally adjusted for maternal employment at 2 and 4 years.

Interpretation

- 4-year-old children who received both NHV (0-2 years) and high-quality ECEC (3-4 years) performed better on some measures of language, word structure and executive functioning compared with children receiving neither.
- However, these differences appeared related to social determinants such as parental education and employment.
- These findings reiterate the challenges inherent in using observational data to approximate experimental design.
- Since NHV and ECEC are already deemed beneficial or widely implemented – our work highlights the need for novel trial designs that can empirically test the theory at scale.
- While dynamic complementarity was not observed, this research offers proof of concept for empirically testing this theory via enhanced provision of high-quality NHV and ECEC.

3. Stacking interventions: the role of place

Thriving communities

Where people live shapes their health, development and wellbeing.

We want children to be conceived, born and raised in communities that support healthy development.

Our health is not defined by things like seeing doctors or taking medicines or getting in our 5,000 steps a day. Rather, it's defined by the full spectrum of our life circumstances, from the families we come from to the neighbourhoods where we live to the people we see and the choices we make.

Professor Sandro Galea
Boston University School of Public Health

Community:
Long term, equity oriented, research &data rich

Prevention

The whole person

A life course approach

Evidence, Data and Analytics

Policy consistency

Inequities that emerge in early childhood track to physical, social and cognitive problems. They are a significant but preventable public health problem.

Catalysts, accelerants & stacking

- **Catalysts**: use data to identify things that could be changed and might work – for example changing a funding model to remove barriers to entitlements such as childcare subsidy. Requires local leadership with policy support.
- **Accelerants:** things that can be changed and we know work (immunisation is a good example). Involves implementing core interventions at high levels of quality and removing barriers to ensure intensity is at the level known to deliver outcomes. Test, evaluate, improve. Work locally and move fast. Requires input from policy makers, resources and funding to lift and assure quality.
- **Stacking:** move away from considering individual programs but look at the service system as a whole-use data to identify key "stackables" across the early years and across the eco-system

Each requires commitment, leadership and adaptability

Create a long term investment framework, trust that people understand their own needs and offer models that focus on people not institutions

Historically, pandemics have forced humans to break with the past and imagine their world anew. This one is no different.
It is a portal, a gateway between one world and the next. We can choose to walk through it, dragging the carcasses of our prejudice and hatred, our avarice, our data banks and dead ideas, our dead rivers and smoky skies behind us.
Or we can walk through lightly, with little luggage, ready to imagine another world. And ready to fight for it.

Suzanna Arundhati Roy