

Strengthening Child Health Systems

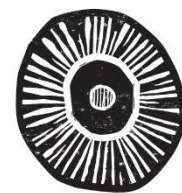
Professor Raghu Lingam
r.lingam@unsw.edu.au



UNSW
SYDNEY



The Sydney children's
Hospitals Network



Maridulu
Budyari
Gumal

CHILD UnLIMITED

Unleashing the potential of chronically ill children



Population
Child
Health



INTEGRATING
CARE

Transforming Health
Systems
for Children and
Young People

FIRST 2000
DAYS



PRIORITY
POPULATIONS



The Sydney
children's
Hospitals Network
care, advocacy, research, education





ACADEMIC EXCELLENCE

383 peer-reviewed publications
\$42 million funding successes.



INNOVATION & ENGAGEMENT

Growth of our team and building research projects



SOCIAL IMPACT

Broadened national and international research networks

2018

2019

2020

2021-22

- 6 academic & professional staff
- > \$1.3 million successful grants
- 4 HDR students
- Established 3 streams

- 8 academic & professional staff
- > \$5 million successful grants
- 4 HDR students
- > 10 projects
- International collaborations

- 14 academic & professional staff
- > \$4.5million successful grants
- 4 HDR students
- > 15 projects
- 100+ links with external partners

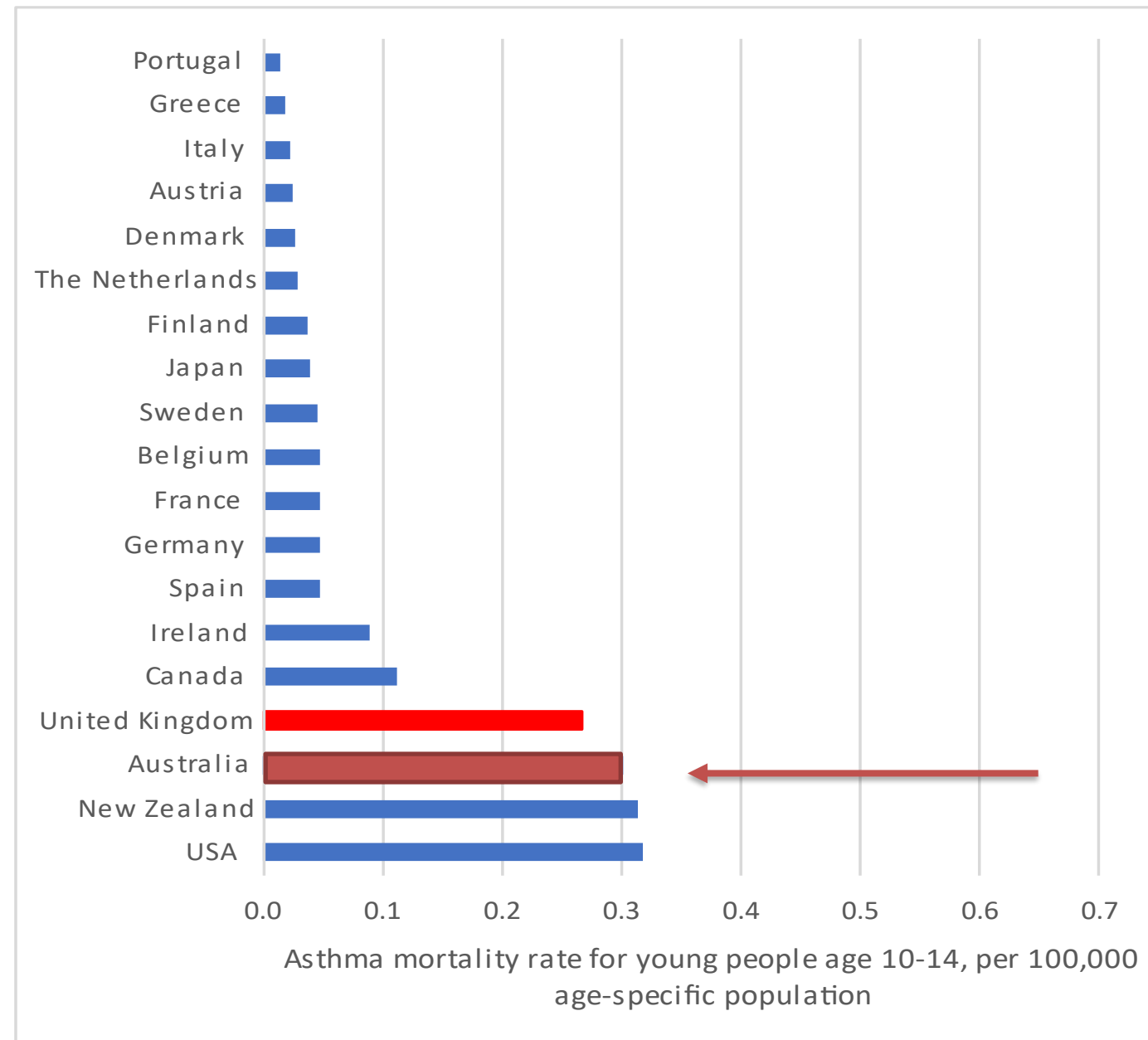
- 14 academic & professional staff
- >\$13.8 million successful grants
- 4 HDR students
- >20 projects
- 100+ links with external partners

Understanding the Problem

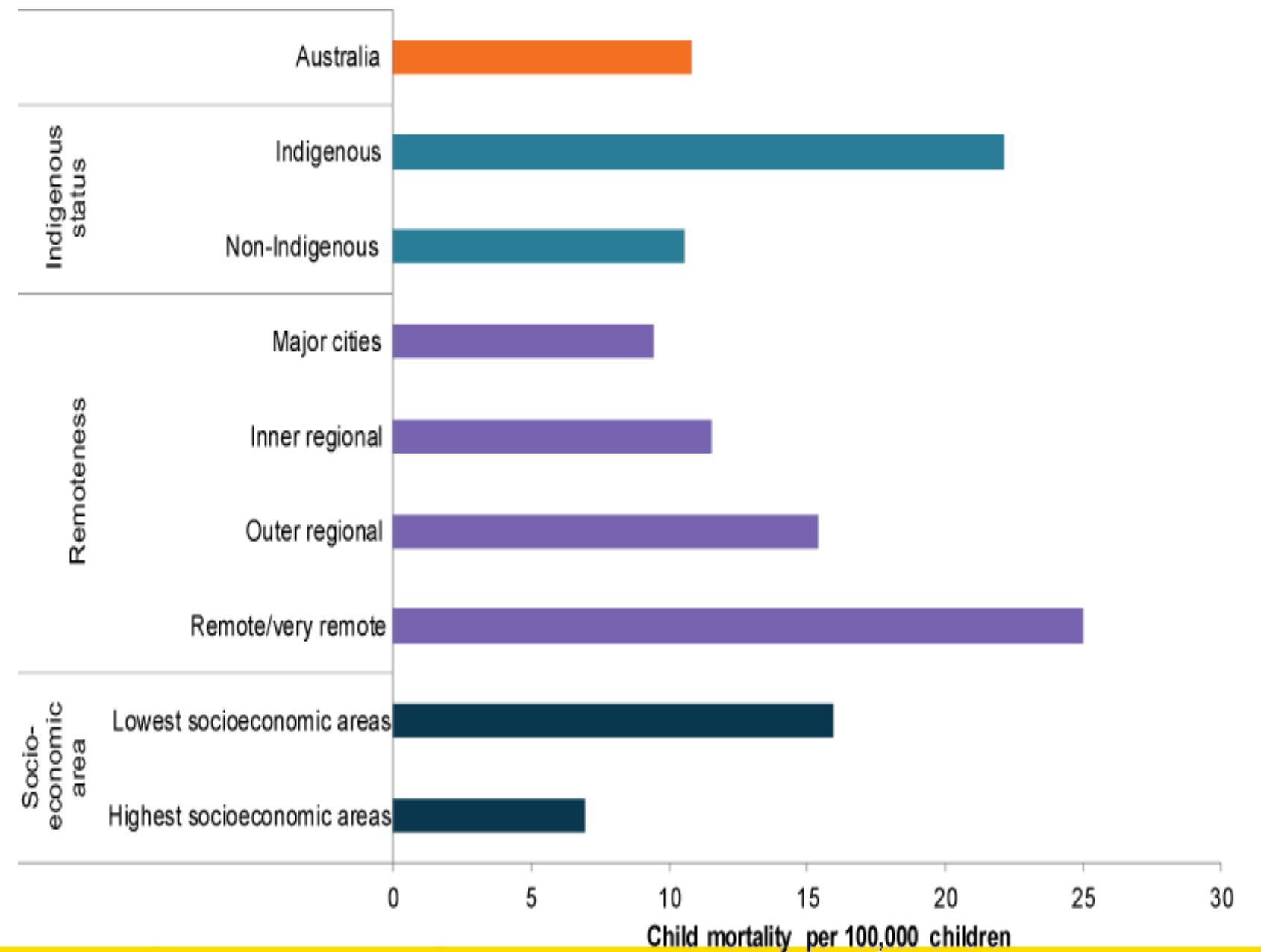
- Approximately 20% of childhood deaths across the USA, England, Australia, and New Zealand are thought to be preventable through better clinical care and patient self-management (Fraser et al, 2014)
- Over the last 20 years, Australia's paediatric population has grown by 18% or 883,759 children
- Children make up an ever-smaller proportion of general practitioner (GP) visits BUT
- Children aged 0-4 years = largest group attending Emergency Departments
- Over last 3 years - referrals to non-surgical OP clinics in our hospital have increased by 100% resulting in OP clinics wait times are 12-18 months
- The quality of care compared to standardized measures across providers is 60% with an average of only 50% of primary care contacts using evidence based guidelines. (Braithwaite 2019)

How are we doing?

Asthma 3rd from bottom from 19 high income countries



But large inequalities

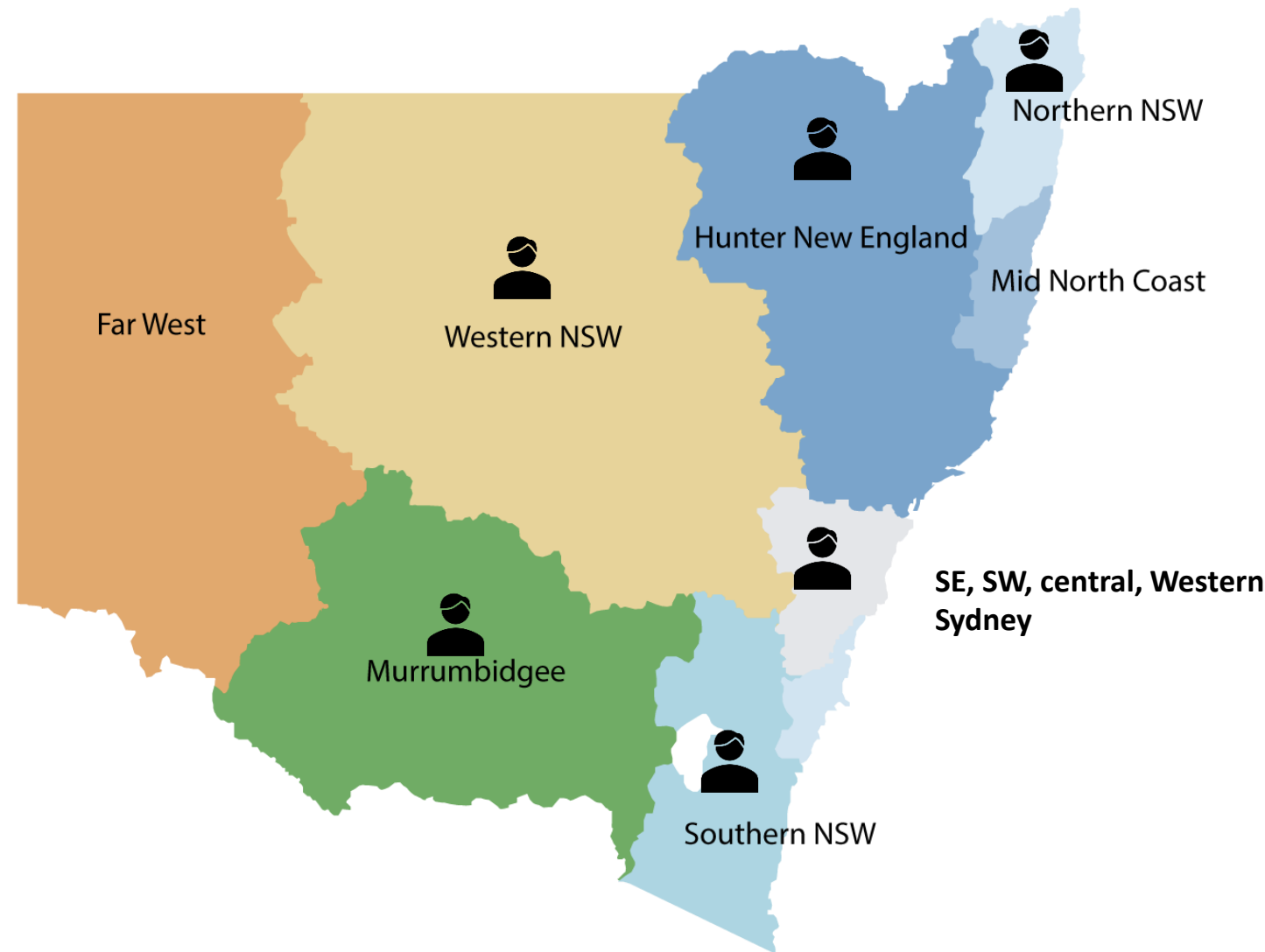


National consumer driven – solution focused research >40 projects

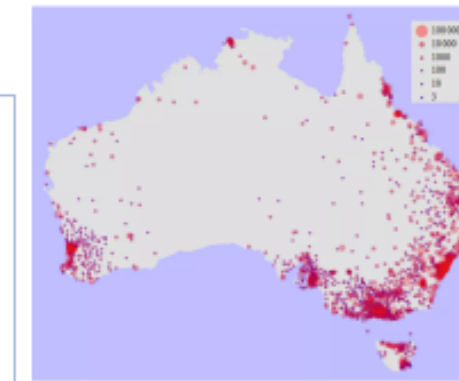
Local Network –

NSW Centre for Child Health Services Research and Innovations (CHRIS)

National and International Network - ChildUnLTD



Perth Children's Institute
Perth Children's Hospital
University of Western Australia



University of Adelaide
Flinders University
Women's and Children's Hospital
Adelaide

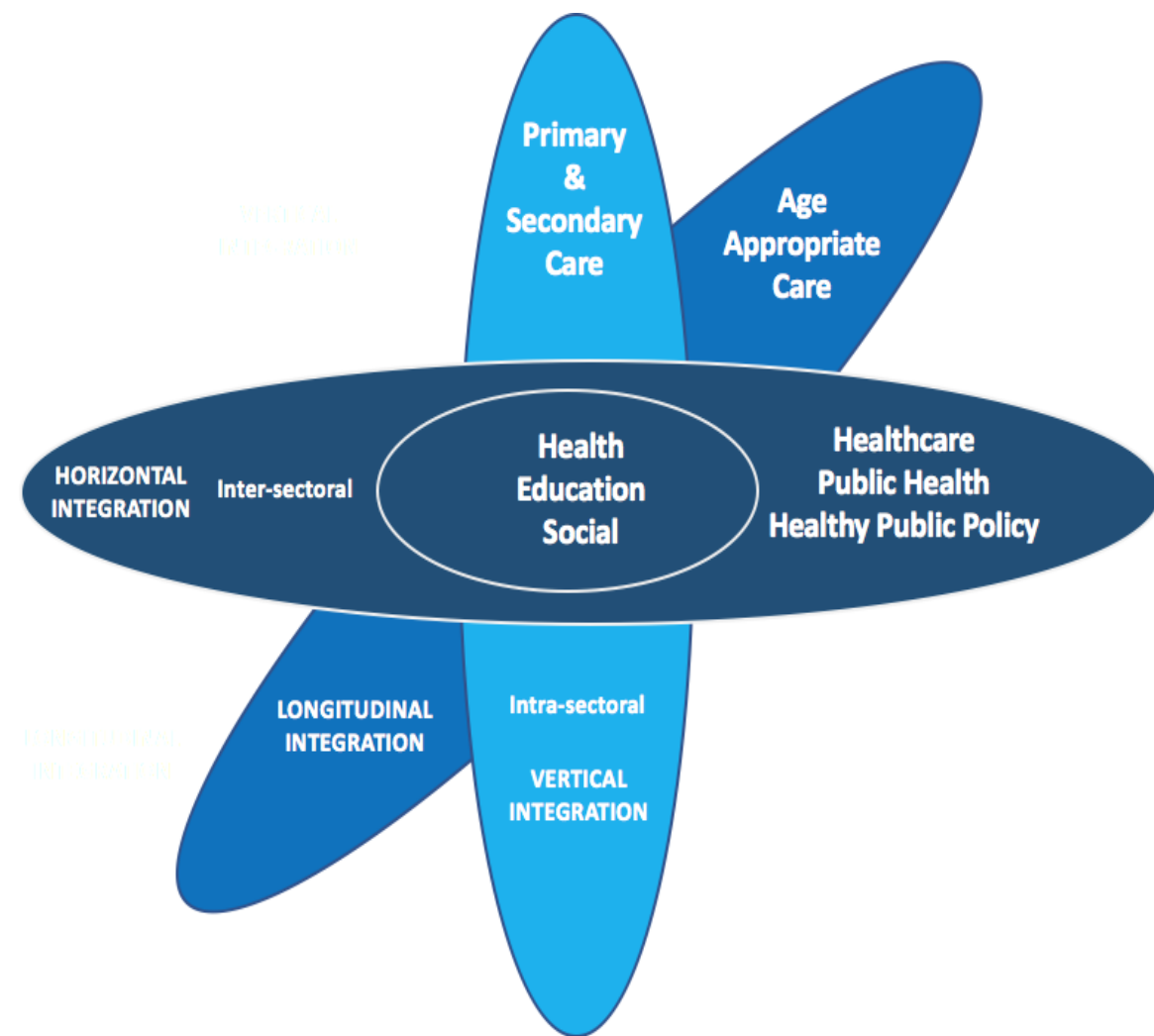
University of Queensland
Queensland Children's Hospital
Brisbane Diamantina Health Partners
Queensland Institute of Technology

Sydney Children's Hospital Network
The University of Sydney
The University of New South Wales
The Children's Cancer Institute
University of Western Sydney

The Murdoch Children's Research Institute
Royal Children's Hospital Melbourne
Monash University

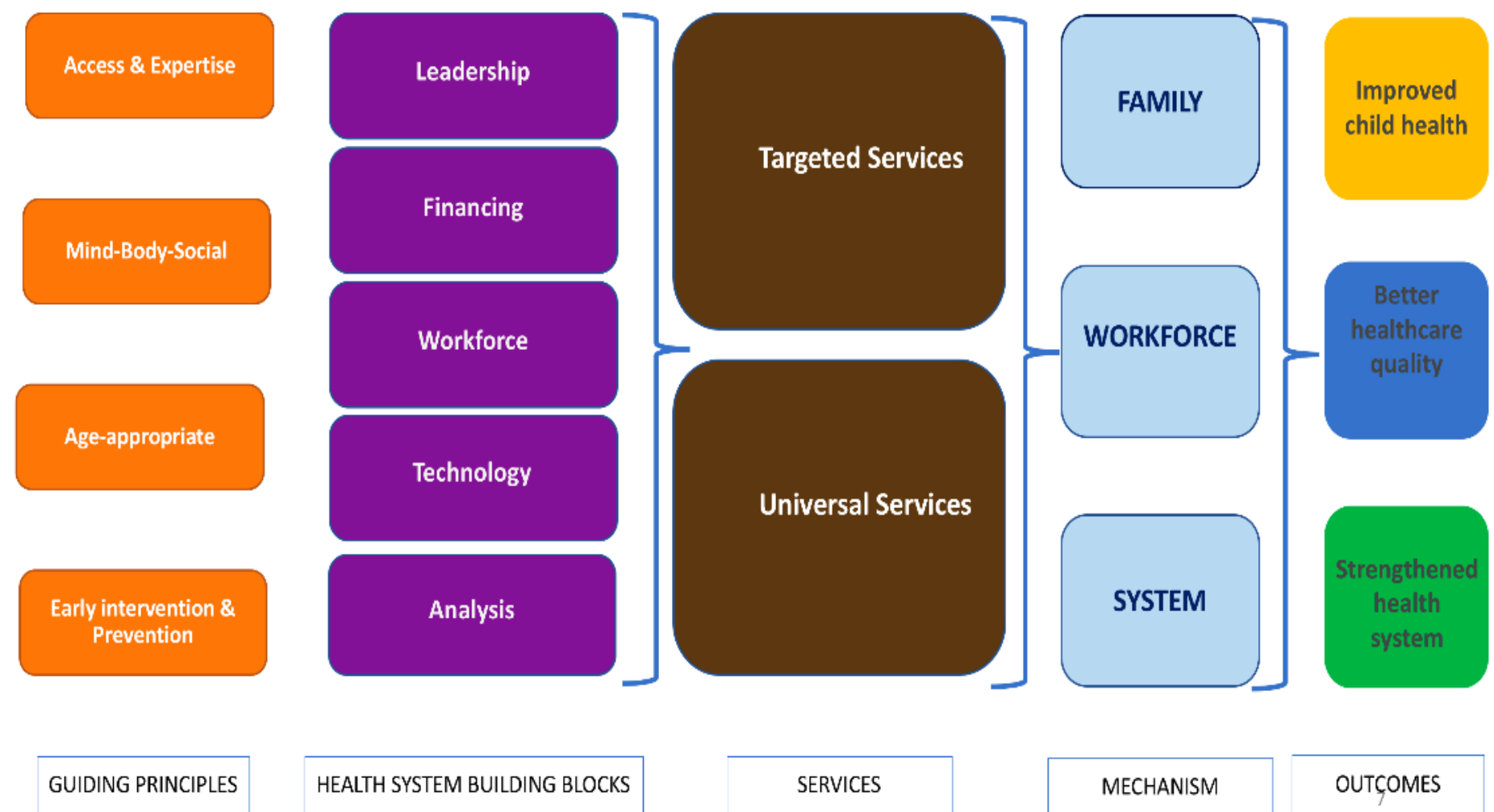
Opportunity to be world leading – creating the evidence

Comprehensive integration



Health system strengthening

CYPHP Health System Strengthening Logic Model



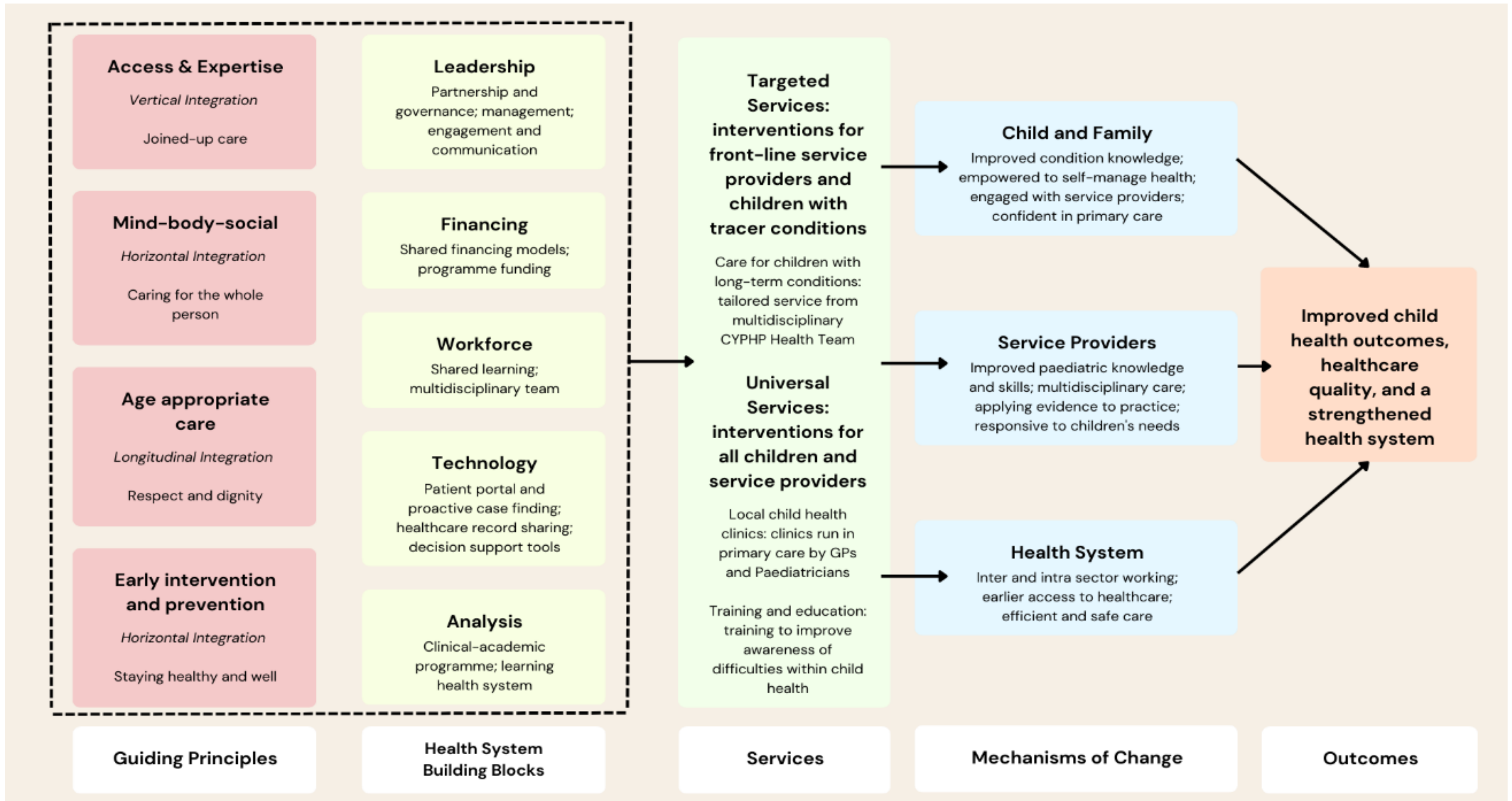


CYPHP delivering
an intervention
for children in
South London

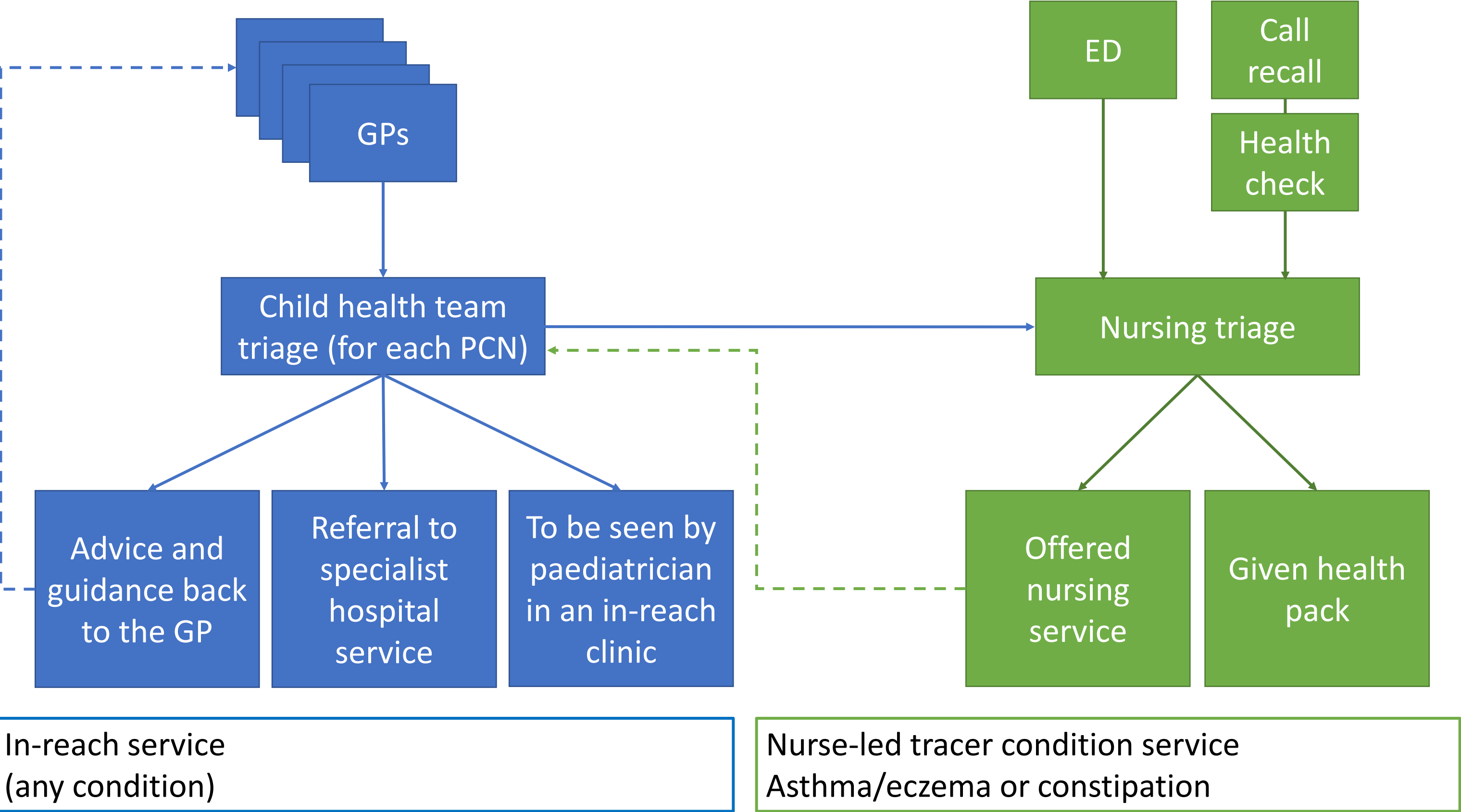
What is CYPHP – Wolfe and Lingam

- A concept
 - To create a learning environment for improving care for children
- A partnership
 - Primary, secondary care providers, local government and academia.
- An ambition
 - A commitment to deliver better, smarter care for children and their families
- A model of care
 - Integrated
 - Whole child centred
 - Bio/psycho/social care
- The largest Children's HS trial globally

The Logic Model



CHILDS model of care services



Enhanced usual care

- **Decision support tools** comprising electronic guidelines and algorithms,
- **Paediatric hotline** rapid communication between GPs and paediatricians.
- **School-based emotional resilience building** and mental health first aid.
- **Minor illness** and wellness services for the most common problems and illnesses,

75 “non pilot GP practices” – organised into hubs of 3-4 clusters each =23 hubs

12 hubs
Enhanced usual care

11 hubs
Full CYPHP model

CYPHP Evelina Model : EUC PLUS

1. **Planned care for long term conditions** e.g. asthma and epilepsy care pathways – community based nursing teams
2. **Increased support for GP’s to treat young people** including in reach clinics and decision support tools

Population level evaluation – health service use n=90,000

Tracer Condition Evaluation – Health related quality of life, mental health and condition specific control & health service use n=2138

Process and implementation, health care quality and economic evaluation

Strengthened CYP health system

Improved child health

Improved healthcare quality



136,794 CYP <16y
(baseline population)
Registered with all GP practices
in Lambeth and Southwark between
April 2018-June 2021

CYP trial population (1)
97,970 CYP registered with GP
practices randomised in CYPHP
programme, with >30d
observation time

Control 49,129 (50%)	Intervention 48,841 (50%)
----------------------------	---------------------------------

CYP with tracer conditions (2)
15,945 CYP (6,790 CYP in clinical service)
Asthma 8,008 (8% prevalence)
Eczema 4,731 (5% prevalence)
Constipation 5,025 (5% prevalence)

Control 7,558 (47%)	Intervention 8,387 (53%)
---------------------------	--------------------------------

CYP with tracer conditions in
clinical service who require care (3)
2,765 CYP

Control 1,448 (52%)	Intervention 1,317 (48%)
---------------------------	--------------------------------

CYP tracer condition and consent
to follow up (4)
1,731 CYP
Asthma 687
Eczema 392
Constipation 1035

Control 911 (53%)	Intervention 820 (47%)
-------------------------	------------------------------

CYP tracer condition in clinical service
who require care and consent to follow
up (5)
998 CYP

Control 510 (51%)	Intervention 488 (49%)
-------------------------	------------------------------

Population need

- 7779 children in total with any tracer condition - completed a health check
- Of the 3616 children with Asthma, 1402, 39% were uncontrolled
- For children with a GP defined diagnosis of constipation (n=15020), 88% (n=1329) had active constipation symptoms
- For the 4491 children with eczema, 2278 (51%) had moderate severe or very severe symptoms.

- In summary, of the 7779 children with at least 1 tracer condition **56% (4371)** had at least 1 uncontrolled condition

Social determinants of health

- Black children had an 33% increased risk of poor asthma control (Risk ratio (RR) (95% CI) 1.33 (1.2 to 1.47) $p < 0.001$)
- Children from the most socio-economically disadvantaged quintile had a 20% increased risk of poor asthma control (RR 1.2 (95% CI 1.11 to 1.31) $P < 0.001$) after controlling for gender, age and ethnicity.

Health Service Use

- Plot of health service use outcomes, displaying estimated incidence rate ratios (with 95% confidence intervals), comparing study arms (CYPHP and EUC)
- Random effects Poisson regression model adjusting for confounders (both baseline cluster and child covariates)
- There was **no statistically significant evidence that CYPHP impacted on health seeking behaviour in children living in Lambeth and Southwark**

Total CYP (population 1)

- Non-elective admissions
- Ambulatory care sensitive admissions
- Emergency department attendance
- Outpatient appointments
- Primary care consultations
- Primary care referrals
- PC referrals CYPHP related

CYP with a tracer condition (population 2)

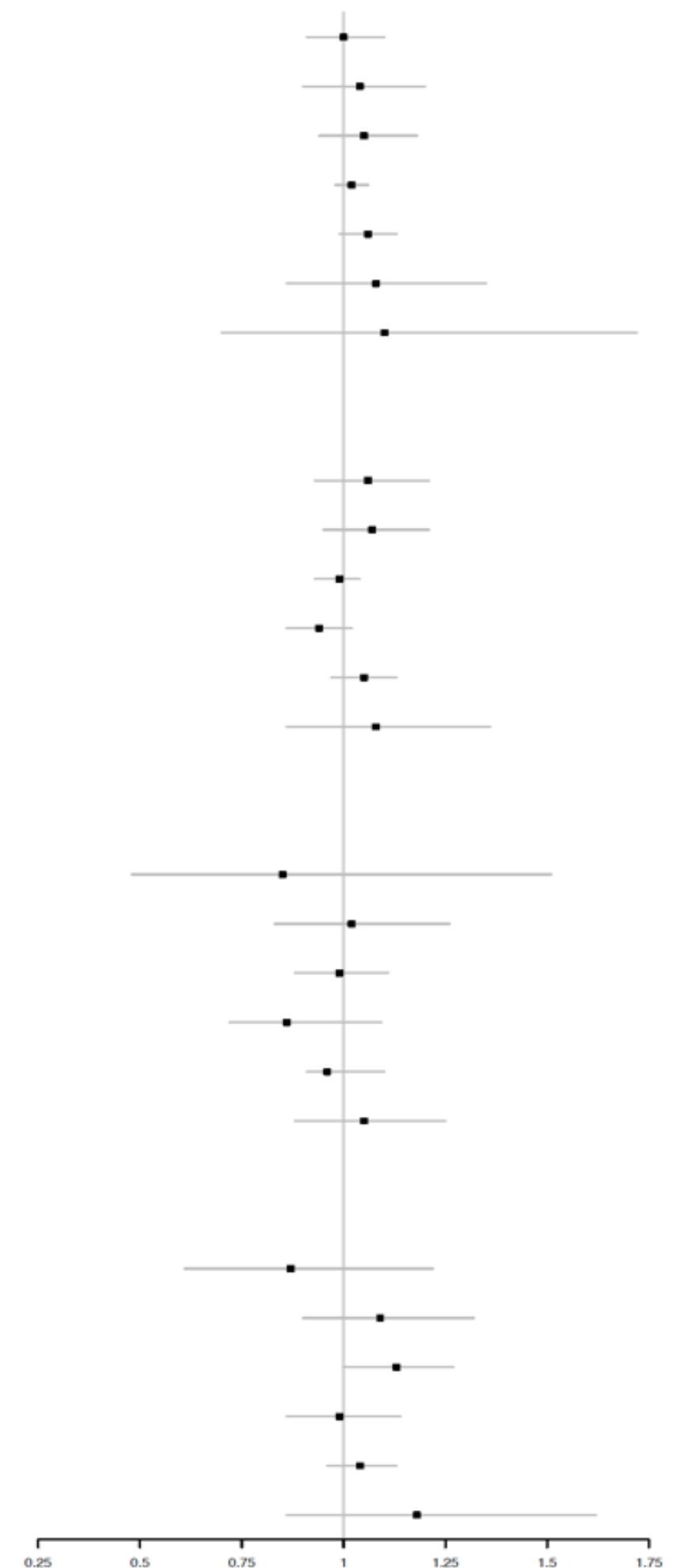
- Non-elective admissions
- Emergency department attendance
- Outpatient appointments
- OP appointments related to tracer conditions
- Primary care consultations
- Primary care referrals

All consented (population 4)

- Non-elective admissions
- Emergency department attendance
- Outpatient appointments
- OP appointments related to tracer conditions
- Primary care consultations
- Primary care referrals

Consent and require care (population 5)

- Non-elective admissions
- Emergency department attendance
- Outpatient appointments
- OP appointments related to tracer conditions
- Primary care consultations
- Primary care referrals



Improvements in health-related quality of life,
child mental health, parental wellbeing

Health-Related Quality of Life and child mental health outcomes

- Plot of Health-Related Quality of Life (PedsQL and CHU9D), child mental health (SDQ), and parental mental wellbeing (WEMWBS) displaying estimated mean differences (with 95% confidence intervals), comparing study arms (CYPHP and EUC)
- Random effects model adjusting for confounders (both baseline cluster and child covariates)
- **There was no statistically significant evidence that CYPHP impacted on health related quality of life or mental health outcomes in children living in Lambeth and Southwark**

All Consented (population 4)

PedsQL* – 6mo

PedsQL* – 12mo

CHU9D** – 6mo

CHU9D** – 12mo

SDQ – 6mo

SDQ – 12mo

WEMWBS – 6mo

WEMWBS – 12mo

Consent and require care (population 5)

PedsQL* – 6mo

PedsQL* – 12mo

CHU9D** – 6mo

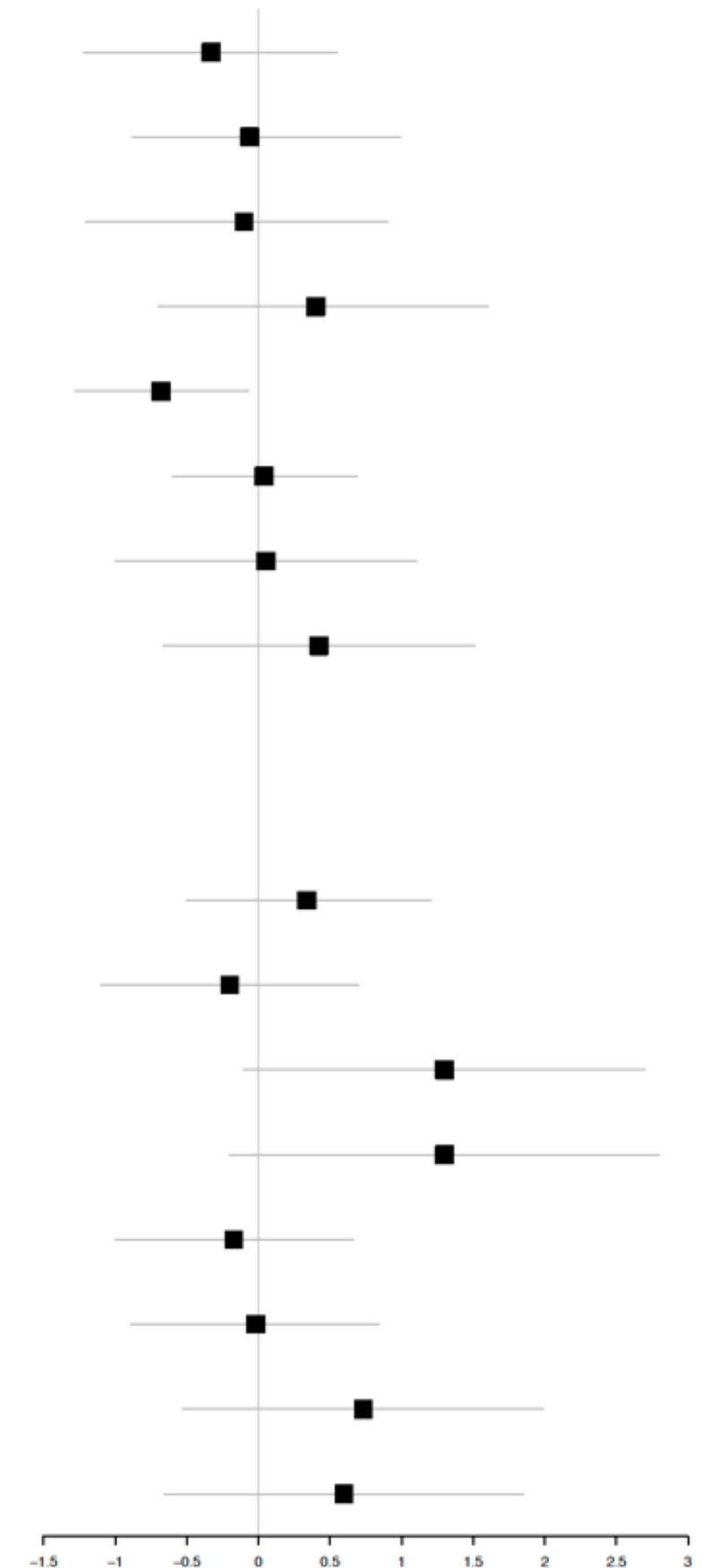
CHU9D** – 12mo

SDQ – 6mo

SDQ – 12mo

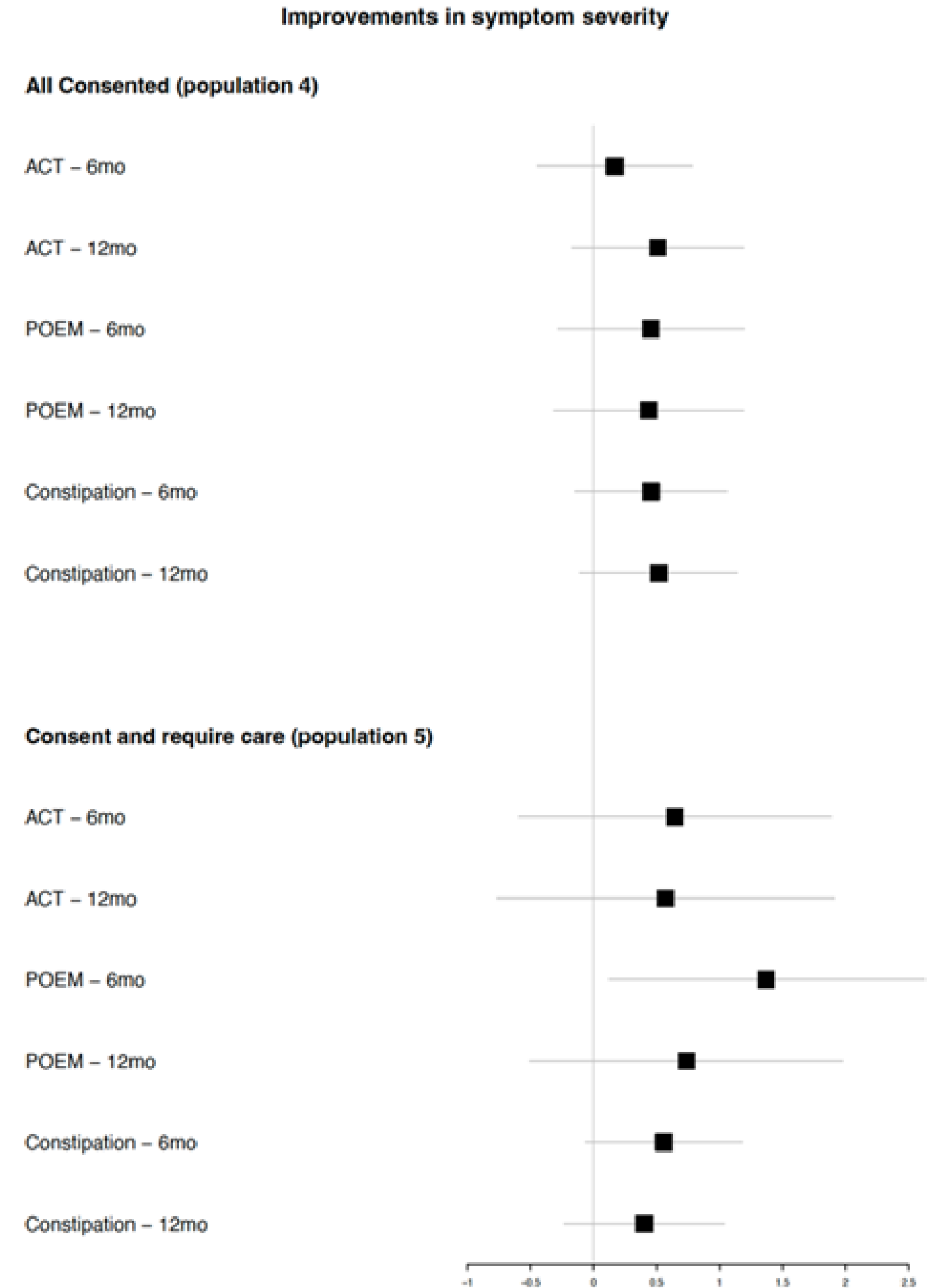
WEMWBS – 6mo

WEMWBS – 12mo



Symptom severity

- Plot of improvements in symptom severity, displaying estimated improvements (with 95% confidence intervals), comparing study arms (CYPHP and EUC),
- Random effects model adjusting for confounders (both baseline cluster and child covariates)
- **Improvements to symptom severity across all conditions but only reaches statistical significance for eczema at 6months**



Quality of Care

	Primary care data				CYPHP Service data	
Quality Indicators	EUC N=314	CYPHP N=263	CYPHP vs EUC		Service N=153	CYPHP vs EUC
	N (%)	N (%)	OR	95%CI	N (%)	OR 95%CI
QI 1 - Asthma action plan	115 (37)	102 (39)	0.92	(0.57 - 1.46)	117 (76)	3.67 (2.44 – 5.51)
QI 2 - Asthma annual review	130 (41)	108 (41)	0.90	(0.57 - 1.41)	NA*	
QI 3 - Asthma control test	167 (53)	135 (51)	0.78	(0.52 - 1.16)	136 (89)	3.03 (1.91 – 4.81)
QI 4 - Documented Height	3 (1)	3 (1)	1.13	(0.09 - 13.51)	26 (17)	11.07 (3.64 – 33.74)
QI 5 - Prescribed spacer (ever)	151 (48)	165 (63)	1.53	(1.03 - 2.25)	N/A**	

Summary of Trial Results

Health service use



There were no significant reductions in health service use

Quality of life



Children had improved health related quality of life but there were also improvements with enhanced usual care.

Health



Children had improved asthma control, constipation symptoms, or eczema symptoms. Statistically significant for eczema at 6m

Quality of care



Children were significantly more likely to have good quality care e.g. 50% more likely to have a spacer, and more than twice an asthma action plan

Interpretations

- Trial methods:
 - Robust trial shows mostly negative results
 - EUC may have reduced effect size
 - COVID pandemic may have reduced effect size
 - Small sample sizes in population sub-groups
 - Insufficient follow-up
 - Quality of life measures may be insensitive in complex intervention
- Implementation:
 - Short implementation time
 - Insufficient buy-in
 - Competing priorities
- Model:
 - Integrated care may not be as effective as anticipated
 - Uncovering unmet need

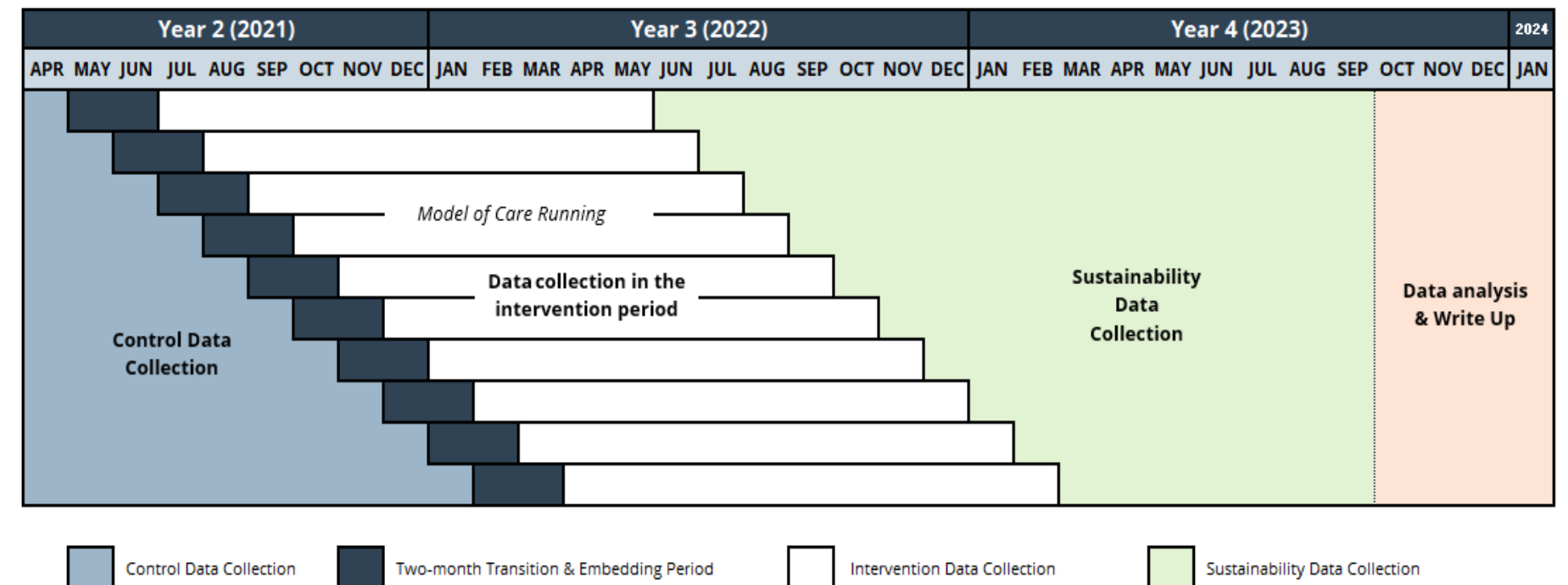
Partnerships - essential and fruitful!



STRENGTHENING CARE FOR CHILDREN

UK - 39% reduction in new patient hospital appointments, a 19% reduction in speciality referrals, and a 22% reduction in ED attendances

AU - 16% increase in parental confidence in GP care and a 12% increase in GP confidence

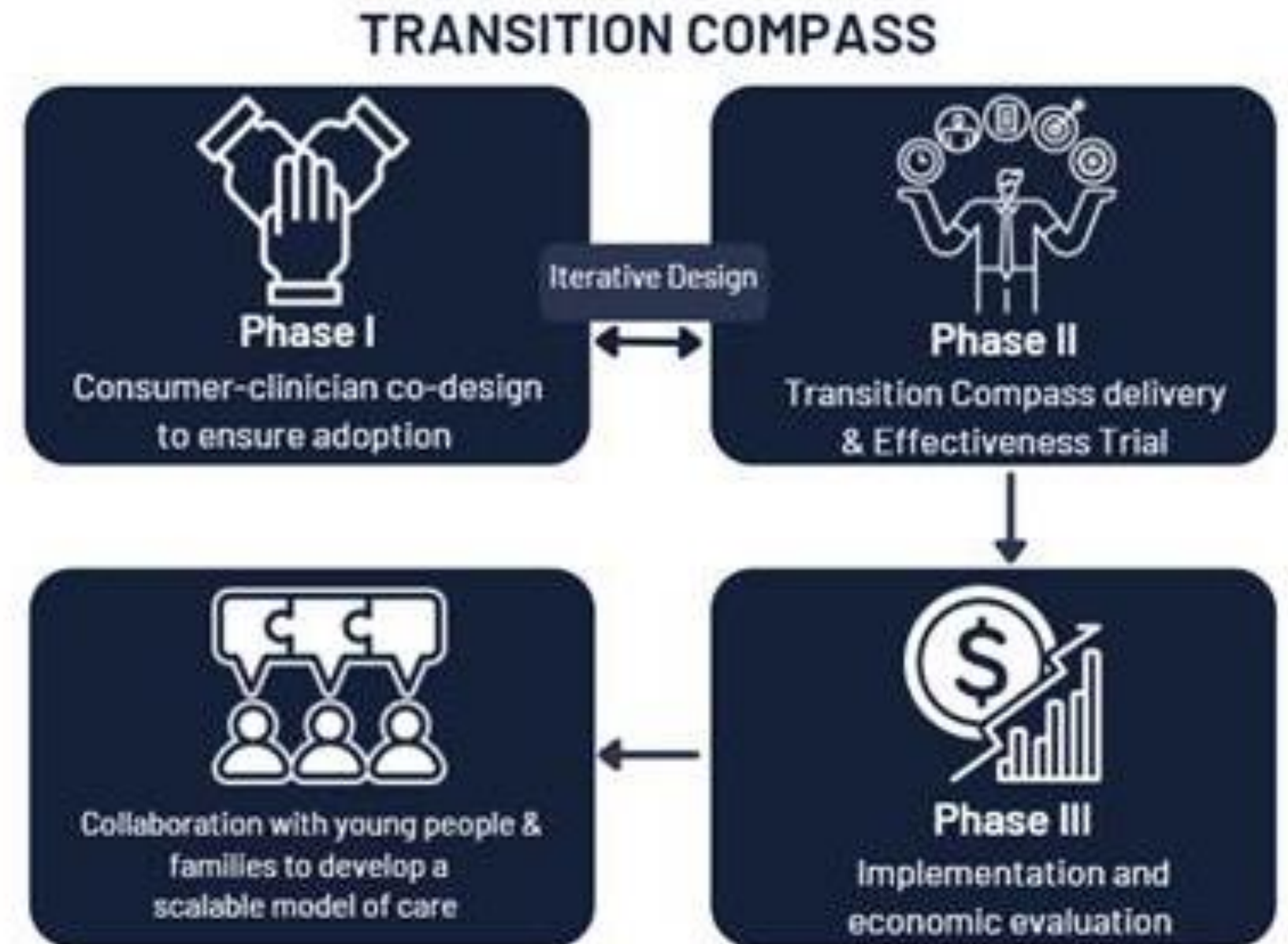


Consumer driven research

EPIC-CP

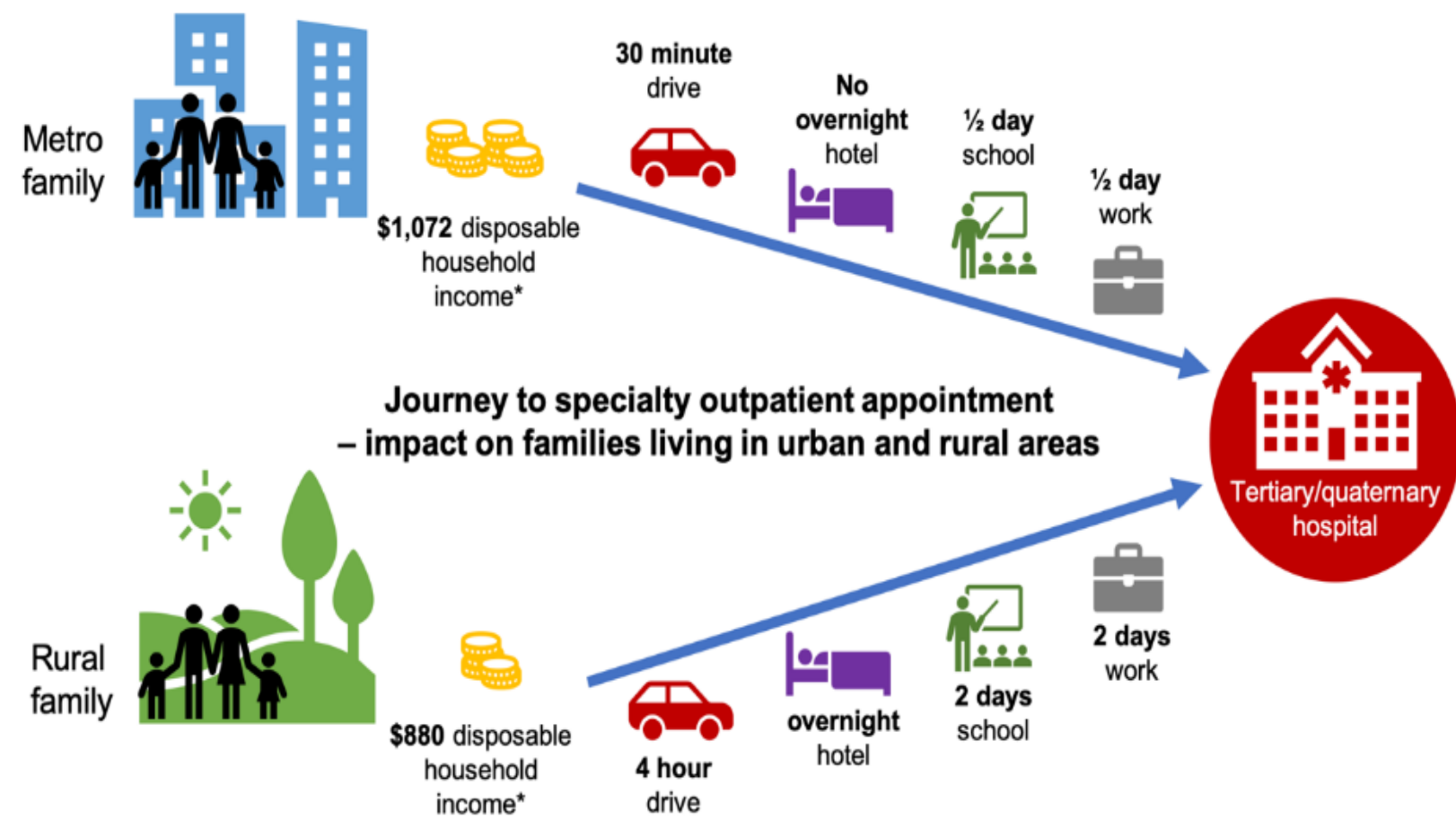
If families are asked about their social and emotional needs, they are up to **40 times** more likely to have these needs met.

Importance of co-design within this care coordinator equity based pathway

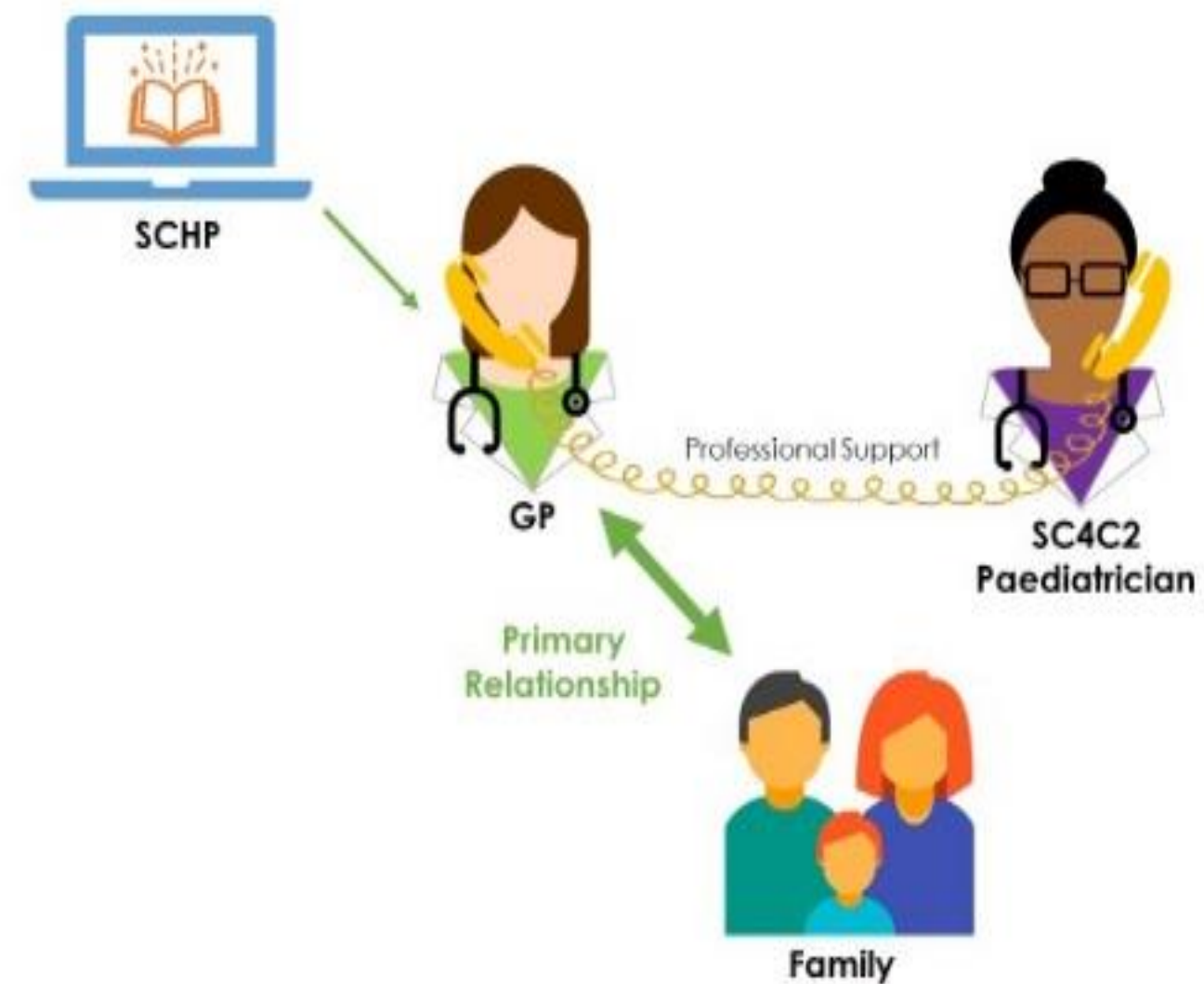


Rural Health

Rural Kids GPS - NSW

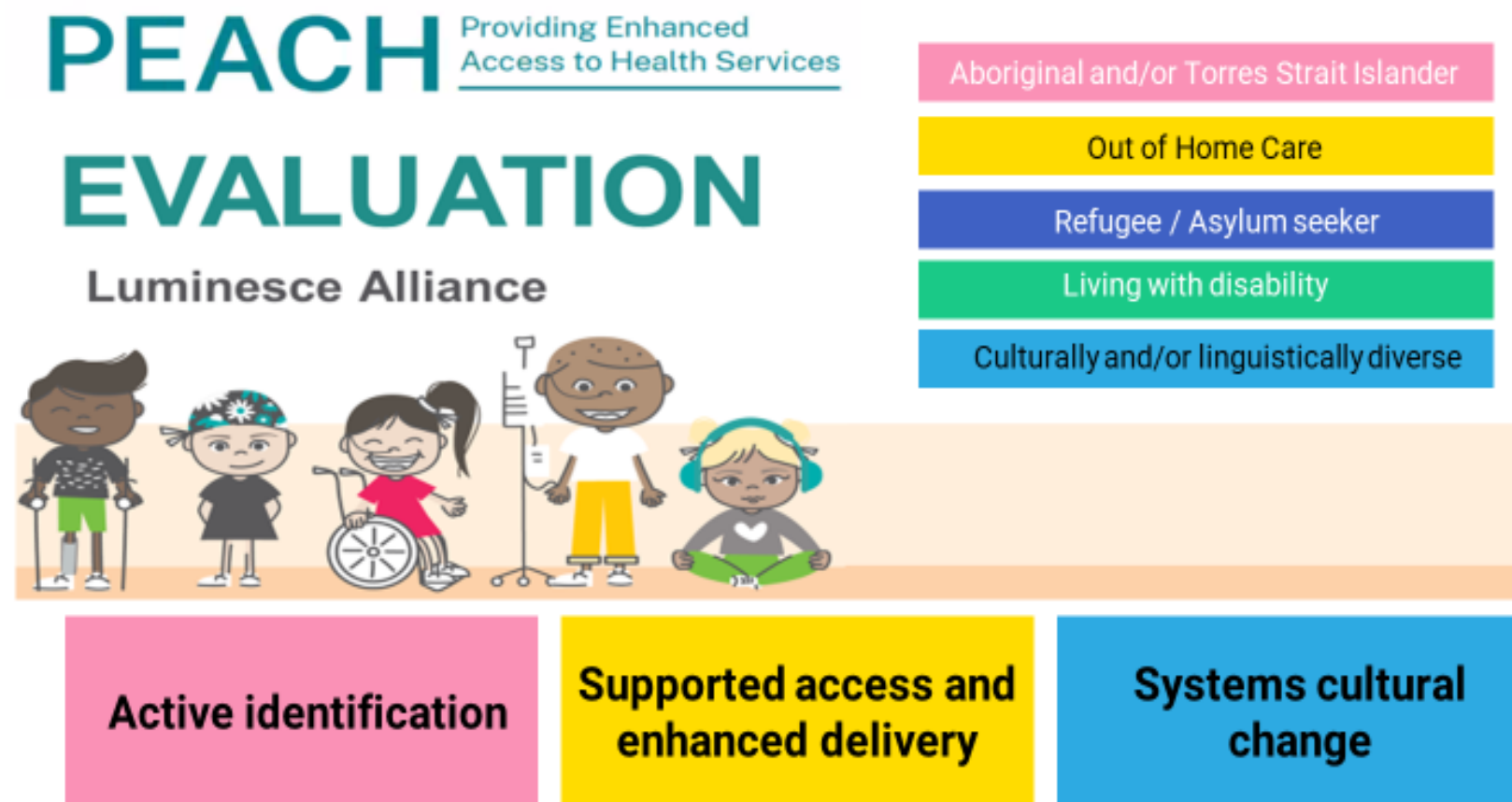


Strengthening Care for Rural Children and SUSTAIN

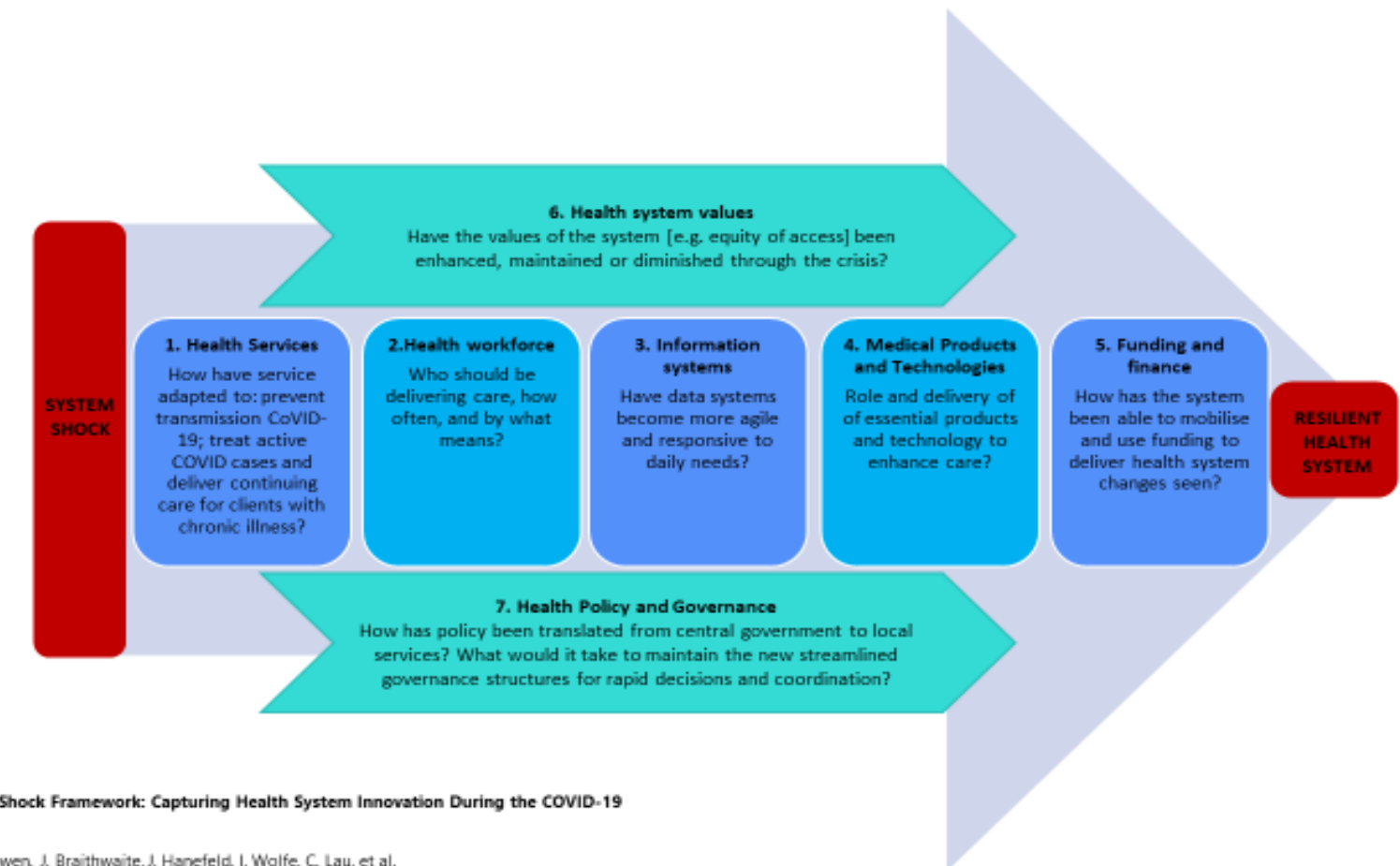


Improving equity and access

Priority populations across SCHN



Mental health in collaboration with MindGardens - Youth integration project



ID-19 System Shock Framework: Capturing Health System Innovation During the COVID-19

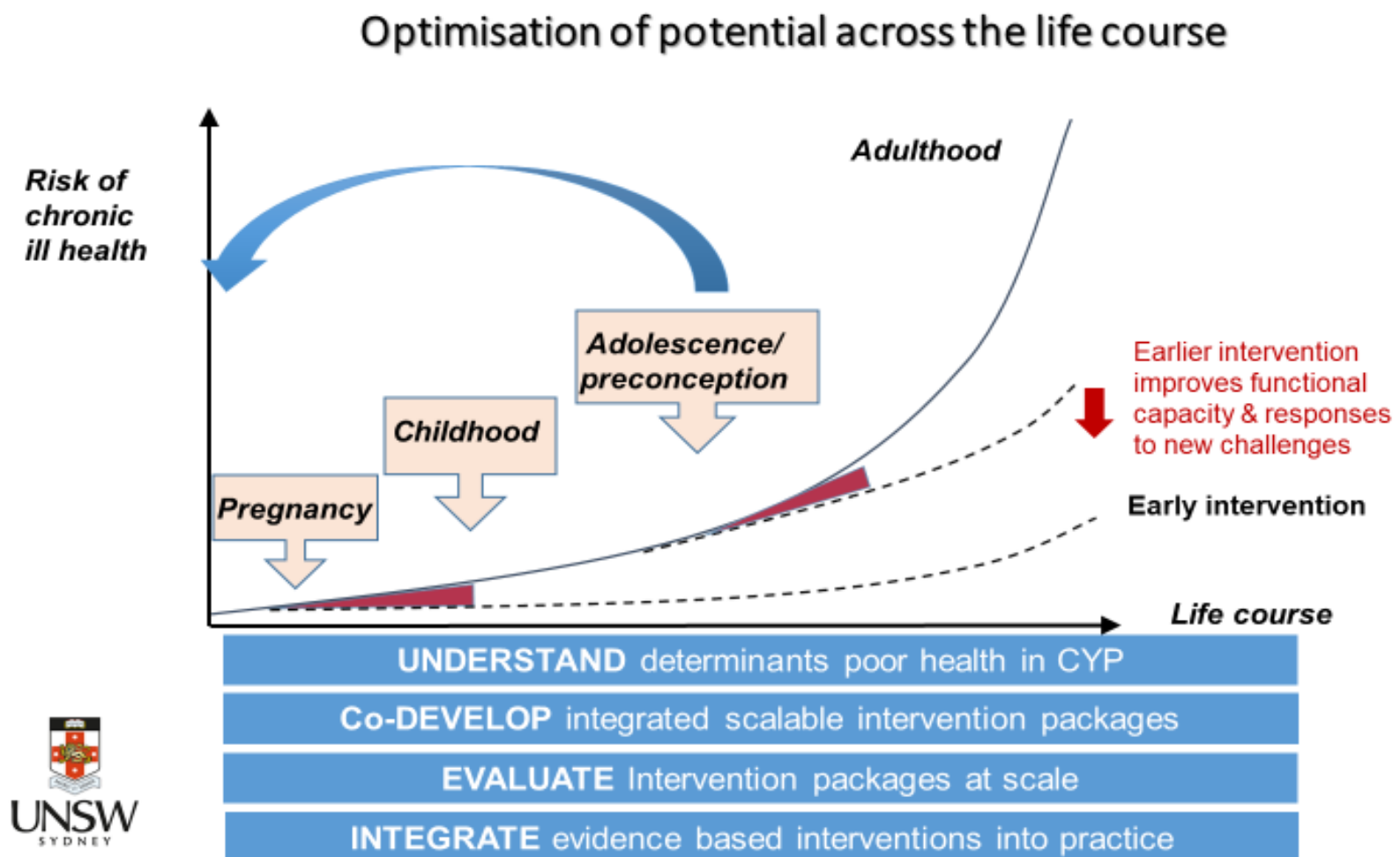
ins, D. van Leeuwen, J. Braithwaite, J. Hanefeld, I. Wolfe, C. Lau, et al.

inal Journal of Health Policy and Management 2021 [The COVID-19 System Shock Framework: Capturing Health System Innovation During the COVID-19 Pandemic](#) ([ijhpm.com](#))

The Future - I think it's bright!

National and International Health services research

Health Systems research



UNSW Medicine & Health
Presents

HealthX:

Future Research and Impact



Please contact me – r.lingam@unsw.edu.au