

# Economic Evaluations of Hypertension Interventions in Pregnancy Lack Standardisation: Results of a Systematic Review

EE173



Ling Jie CHENG<sup>1,2</sup>, Lucy ABEL<sup>3</sup>, Svetlana RATUSHNYAK<sup>2</sup>, Oliver RIVERO-ARIAS<sup>2</sup>, Richard J. MCMANUS<sup>4</sup>, Lucy C. CHAPPELL<sup>5</sup>, Helen E. CAMPBELL<sup>2</sup>

<sup>1</sup> Alice Lee Centre for Nursing Studies, Yong Loo Lin School of Medicine, National University of Singapore, Singapore; <sup>2</sup> National Perinatal Epidemiology Unit, Nuffield Department of Women's and Reproductive Health, University of Oxford, Oxford, United Kingdom; <sup>3</sup> Nuffield Department of Primary Care Health Sciences, University of Oxford, Oxford, United Kingdom; <sup>4</sup> Dean's Office, Brighton and Sussex Medical School, University of Brighton and University of Sussex, Brighton, United Kingdom; <sup>5</sup> Department of Women and Children's Health, King's College London, London, United Kingdom

## BACKGROUND & AIMS

- Hypertensive disorders of pregnancy (HDP), including pre-eclampsia, affect 5–10% of pregnancies globally, causing ~46,000 maternal and ~500,000 fetal/newborn deaths annually.
- Women face elevated lifelong risks of cardiovascular disease; infants experience increased risks of prematurity and neurodevelopmental complications.
- Economic evaluations face methodological challenges. Although interventions affect both the woman and the infant, analysts are often uncertain whether, and how, to incorporate both sets of outcomes into the cost-effectiveness calculation while also modelling long-term consequences.
- This systematic review examined how economic evaluations of HDP interventions have been conducted, focusing on methodological approaches, outcome measurement, study perspectives, time horizons, and cost-effectiveness conclusions.

## METHODS

- Guidelines and registration:** PRISMA 2020 and ISPOR CiCERO guidelines; PROSPERO registration (CRD42019123881)
- Data sources:** MEDLINE, Embase, EconLit, and Web of Science (from inception to 31 December 2024; updated 4 November 2025); reference lists, HTA reports, and Google Scholar
- Inclusion criteria:** Economic evaluations (CEA, CUA, CBA, CCA, CMA) of HDP interventions, including prevention, screening, diagnosis, and management
- Study selection:** Four independent reviewers; Cohen's  $\kappa = 0.91$
- Reporting quality assessment:** CHEERS 2022 checklist
- Data extracted:** Economic evaluation framework; maternal and infant health outcomes; QALY/DALY construction methods; time horizon and extrapolation; study perspective; cost-effectiveness conclusions; CHEERS 2022 reporting quality

## RESULTS

### Study Selection & Characteristics

- 4,564 records screened; 35 studies included
- Most published after 2015; predominantly high-income settings (Table 1)
- 14 CEA, 8 CUA, 6 CCA, 5 CMA; 2 reported both CEA and CUA (Figure 1)
- Interventions: prevention/screening (n=14), diagnosis (n=5), management/monitoring (n=16) (Figure 2)

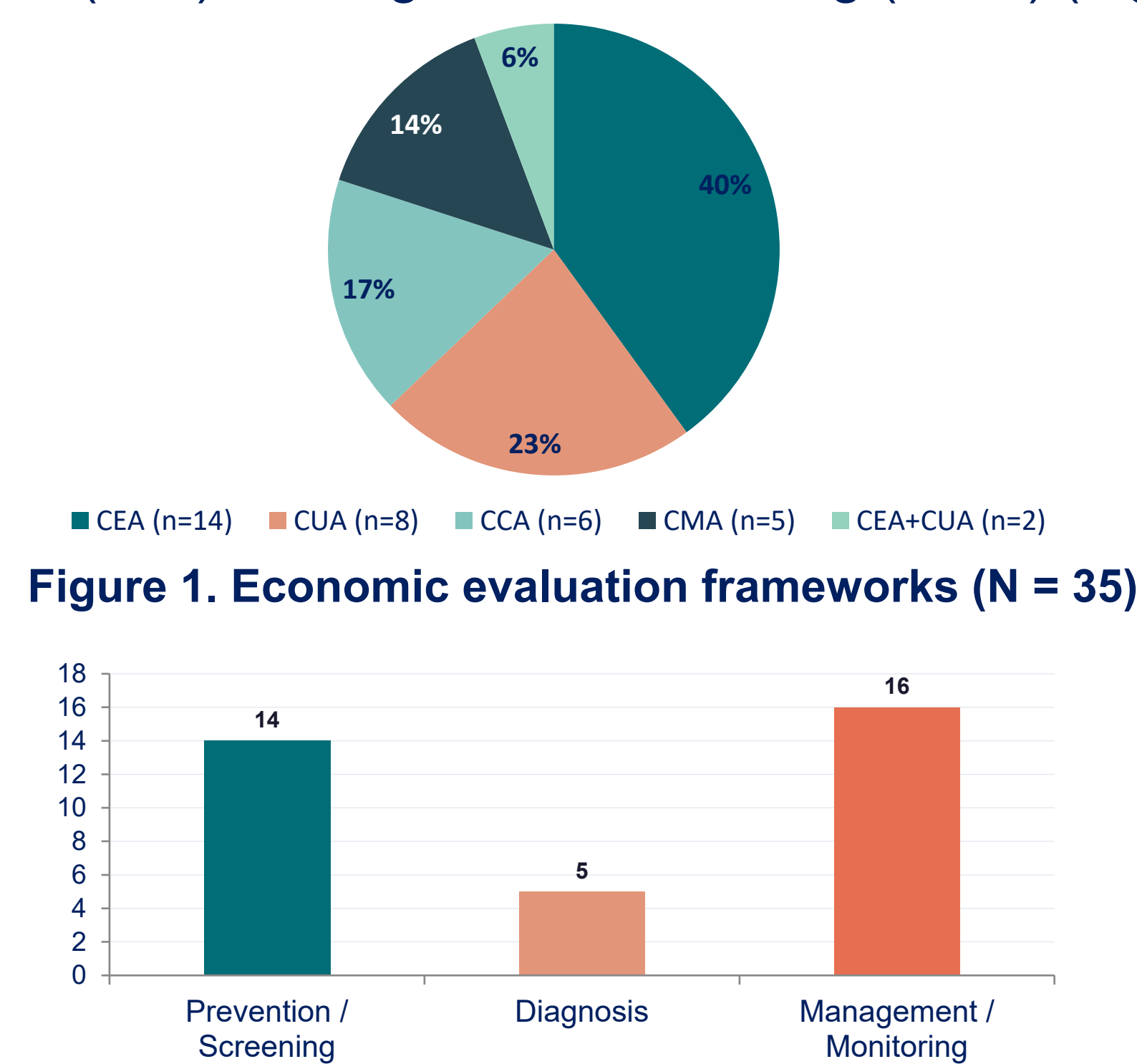


Figure 1. Economic evaluation frameworks (N = 35)

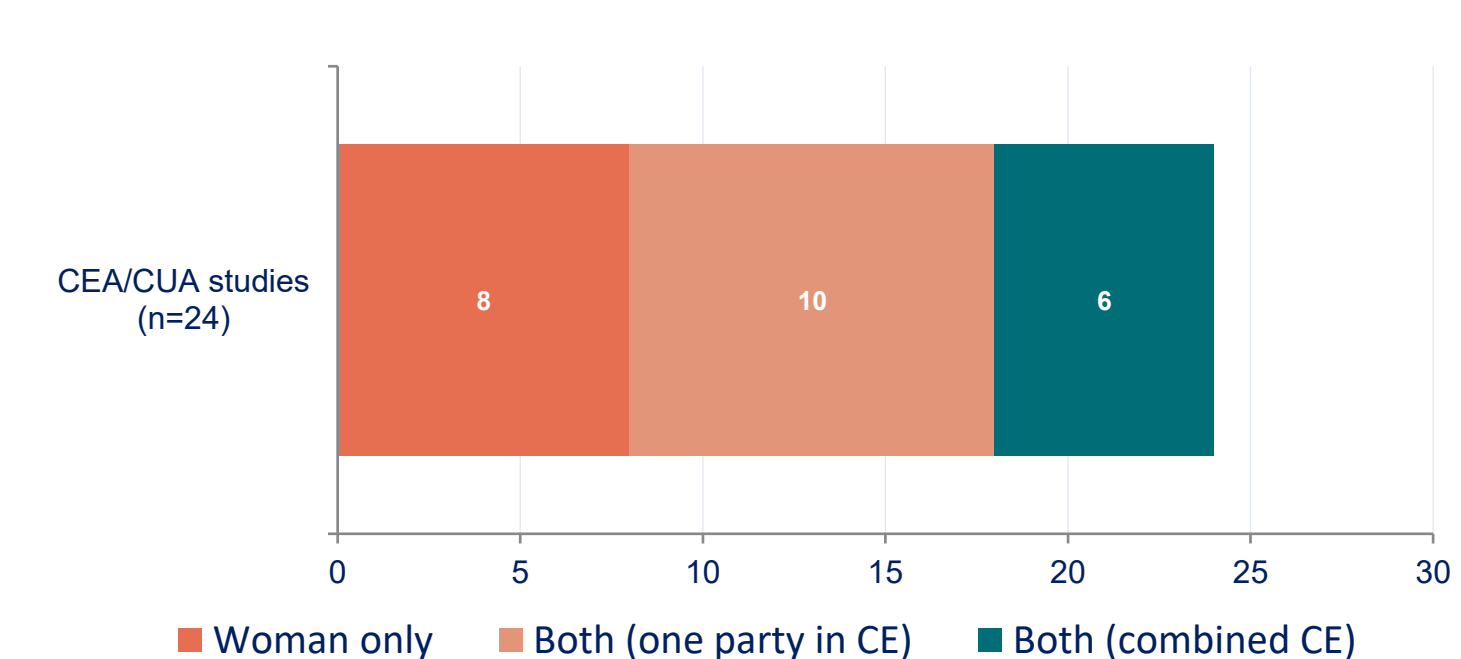


Figure 3. Outcome reporting in CEA/CUA studies: who is included?

### Health Outcomes (Figure 3)

- 1/3 of CEA/CUA studies reported only women's outcomes
- Among 16 studies capturing both, 62.5% included only one in the cost-effectiveness calculation, reflecting uncertainty in outcome aggregation. (Figure 3)
- Pre-eclampsia was the most frequent maternal outcome (n=19); neonatal mortality was the most frequent infant outcome (n=15)

### QALY Construction & Time Horizon (Figure 4)

- Only 20% (7/35) modelled lifetime horizons
- All 20 modelling studies used simple decision trees
- None used multi-state Markov frameworks for long-term CVD risks or prematurity complications

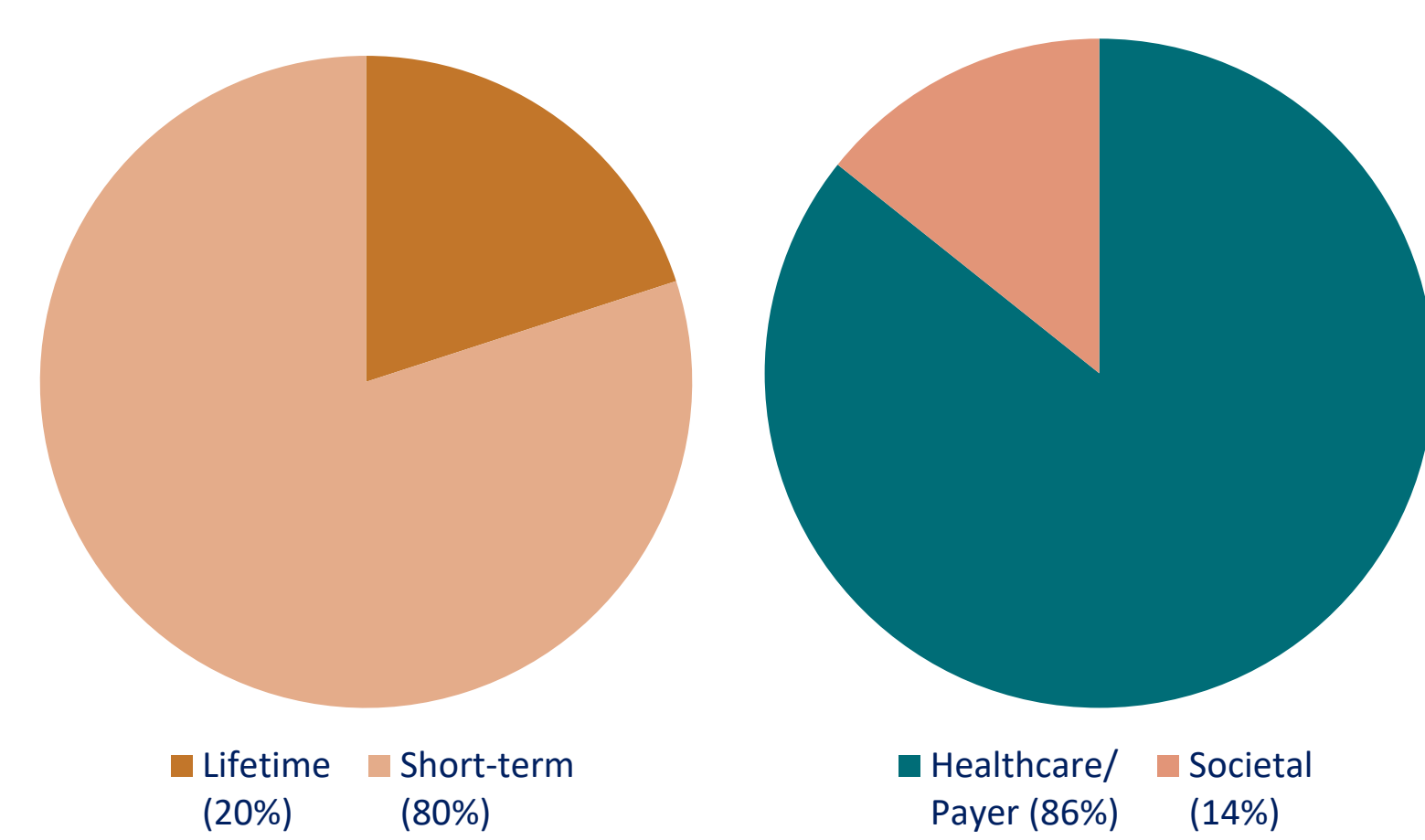


Figure 4. Time horizon

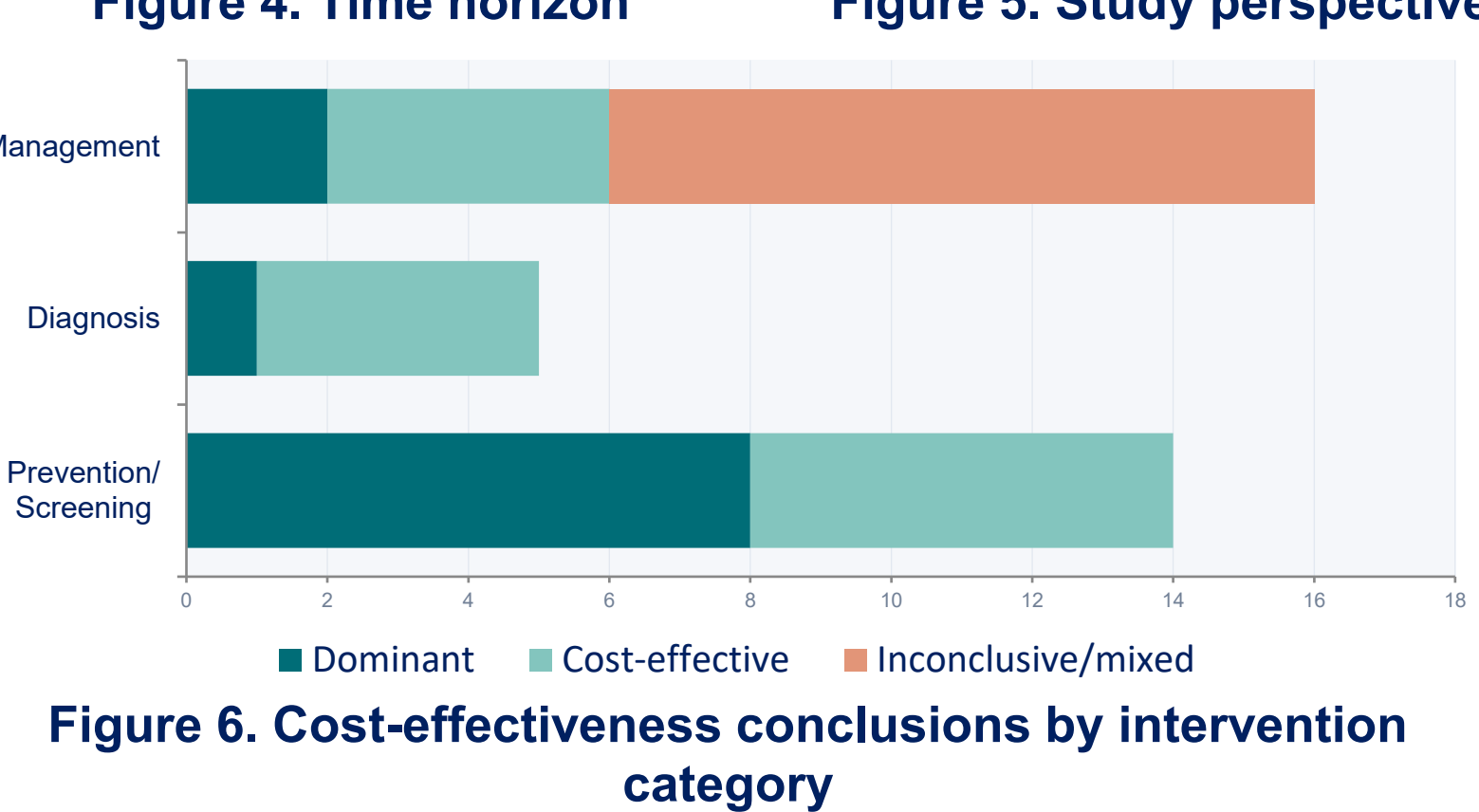


Figure 6. Cost-effectiveness conclusions by intervention category

### Study Perspective (Figure 5)

- 86% (30/35) adopted healthcare/payer perspective only
- 5 claimed societal perspective but limited to travel, informal care, or ≤6-week productivity losses

### Cost-Effectiveness (Figure 6)

- Screening/prevention: 57% showed dominance
- Diagnosis: generally cost-effective below WTP thresholds
- Management: less consensus; considerable heterogeneity across studies

Table 1. Key Methodological Findings Across 35 Studies

Domain	Finding
Studies included	35 studies; most published after 2015; predominantly high-income countries
Evaluation frameworks	14 CEA, 8 CUA, 6 CCA, 5 CMA, 2 both CEA+CUA
Intervention categories	Prevention/screening (n=14), diagnosis (n=5), management/monitoring (n=16)
Outcome reporting	1/3 of CEA/CUA reported only women's outcomes; among those with both, 62.5% estimated CE for one party only
QALY construction	Considerable variation in time horizons, quality adjustments, discounting (3.0–5.0%); lifetime infant QALYs: 18.5–30.4 years
Time horizon	Only 20% (7/35) modelled lifetime; all used simple decision trees; none used Markov models
Perspective	86% healthcare/payer only; 5 claimed societal but limited to travel/informal care
Modelling approach	All 20 modelling studies used decision trees; none used multi-state Markov for long-term CVD or prematurity
Prevention/screening CE	57% showed dominance; most reported cost per PE case averted (no established WTP threshold)
Diagnosis CE	Generally cost-effective; earlier diagnosis with targeted management below WTP thresholds
Management CE	Less consensus; considerable methodological heterogeneity; inconsistent findings
CHEERS 2022 quality	60% reported time horizon; 80% stated perspective; reporting ranged 57–100% of items

## DISCUSSION & CONCLUSIONS

- Substantial methodological heterogeneity limits comparability across economic evaluations of HDP interventions.
- Even when both are measured, most evaluations include only one party in the cost-effectiveness calculation, reflecting uncertainty about combining maternal and infant benefits.
- Cost per PE case averted (the most common metric) lacks an established WTP threshold, limiting interpretation of prevention/screening evidence.
- Greater standardisation in evaluation framework, outcome measurement, time horizons, and perspectives is essential to enhance the utility of health economic studies in HDP and ultimately improve outcomes for women and their infants.

## CONTACT INFORMATION

X: @JeremyChengLJ

Email Address:  
[jeremy.cheng@npeu.ox.ac.uk](mailto:jeremy.cheng@npeu.ox.ac.uk)  
[cheng.lingjie@nus.edu.sg](mailto:cheng.lingjie@nus.edu.sg)

### Funding

National Institute for Health Research (NIHR) Programme Grant for Applied Research (RP-PG-1209-10051). Cheng LJ is supported by a NUS Overseas Postdoctoral Fellowship under the START Award.

