CASE STUDY – EVALUATION OF PROJECT CARE

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INTRODUCTION

This is the final newsletter in the series on *programme evaluation*. The first newsletter described the what, why and when of programme evaluation, the second on theory of change and logic models, and the third on evaluation design. This final issue features a case study on the evaluation of an end-of-life (EOL) programme.

Challenges of EOL programme evaluation

Randomised Controlled Trials (RCTs) are perceived as the gold standard method for evaluating healthcare interventions. However, a complex intervention like a palliative programme raises ethical and sensitive issues when an RCT is proposed. The recruitment of controls can be a challenge as we cannot justify randomising dying subjects to treatment and control groups. Hence, investigators have to choose between an evaluation with either no comparator group or a control group with some confounding and biases (Figure 1). Data availability of key out-comes such as hospitalisation and healthcare costs remains a challenge. We describe a case study of an evaluation of **Project CARE** (**Care at the end-of-life for Residents in homes for the Elderly**) with a quasi-experimental study design.
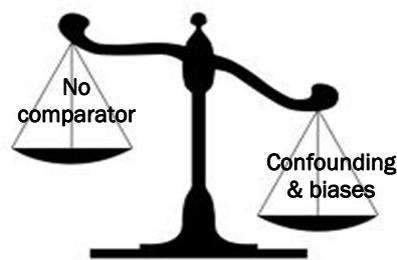

Figure 1 — Tradeoff for evaluation of complex intervention framework

Figure 2 — Quasi-experimental design

Project CARE is a pilot programme aimed at introducing palliative care systematically into seven voluntary welfare nursing homes within the catchment of Tan Tock Seng Hospital. It enables EOL discussion between healthcare providers and residents/family members through Advance Care Planning (ACP). By respecting residents'/family members' preference of care and providing manpower support for palliative care management within the nursing homes, the programme aims to reduce hospitalisation, hospital length of stay (LOS) and costs within the healthcare system.

Quasi-experimental designs are studies that evaluate interventions without randomisation. It demonstrates causality between the intervention and outcomes. However, due to the non-randomness of such studies, the statistical association could often be attributed to alternative explanations such as difficulty in measuring or controlling for important confounding variables.
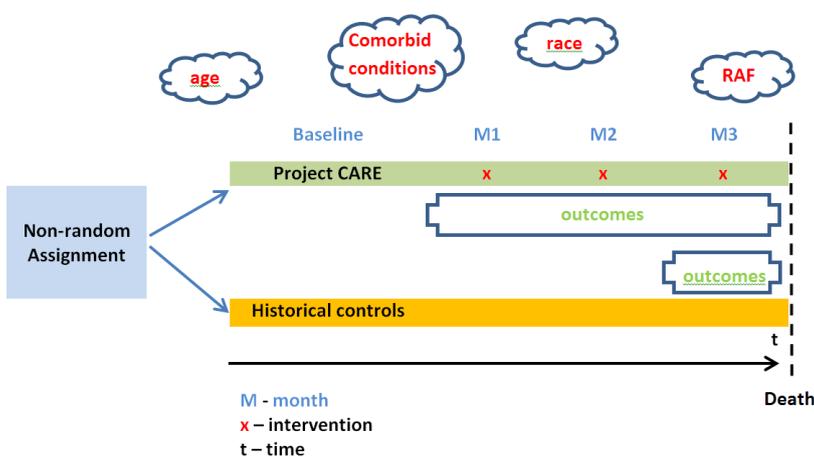
The study design

The evaluation of Project CARE utilised a quasi-experimental design with a matched historical control group (Figure 2). Key to the evaluation was the algorithm logic used to match both the Project CARE cases and controls. The clinical algorithm included the diagnosis of advanced diseases, more than two acute hospital episodes within the past six months, poor physical function, and clinical judgement. The multisite study was carried out in seven nursing homes and compared the health resource utilisation of deceased nursing home residents. A group of nursing home residents deceased over a two-year period before Project CARE initiation was chosen as the control group. Since a historical control group was chosen, both baseline characteristics and healthcare utilisation had to be extracted from the nursing home case-notes. The outcomes were: (1) risk of hospitalisation; (2) number of hospitalisations; (3) cumulative LOS; and (4) healthcare costs. The cost analysis was conducted from the healthcare system perspective. Comparisons between Project CARE cases and controls were made for the last three months (90 days) and final month (30 days) of life.

The impact of Project CARE

Compared with Project CARE cases, the controls had higher odds of being hospitalised (6.9 times), more hospitalisation episodes (3 times), longer cumulative LOS (2.1 times) and incurred higher healthcare costs ($7,127 higher) in the final months of life (Table 1). These results could assist policymakers and health care providers in their decision-making on the allocation of healthcare resources. However, the results could be limited by the confounding of unobserved factors such as primary diagnosis and severity of condition.

Table 1 — Adjusted outcomes (95% confidence interval), control group as reference*

Time horizons	Hospitalisation (Yes/ No)	Number of hospital admissions	Cumulative hospital LOS	Healthcare cost, §
Last three months of life	6.9 (3.4, 13.9)	3.0 (2.0, 4.6)	2.1 (1.8, 2.4)	-$7,127 (-$9,730, -$4,524)
Final month of life	4.6 (2.4, 9.5)	2.5 (1.5, 4.1)	1.3 (1.1, 1.6)	-$3,723 (-$5,557, -$1,848)

* Multivariate analysis adjusted for baseline differences: age, race, Residential Assessment Form (items 1-4) and number of comorbid conditions
§ - Healthcare cost included hospitalisation LOS, nursing home LOS, ED visits, Specialist Outpatient (SOC) visits, polyclinic visits and Project CARE services.

Final takeaway

Investigators have to decide between the feasibility of an RCT study design and confounding from a quasi-experimental study. Where an RCT is not possible, a well-designed quasi-experimental study can inform decision-making for complex interventions. The Project CARE evaluation demonstrates how researchers overcame the obstacles by using a matched historical control group, and by extracting data from nursing home case-notes. The effectiveness and cost-saving results of Project CARE supports its expansion to other nursing homes.

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