SUPPLEMENT D - Data collection and sampling plan

Objective	Research question	Outcome measure	Data source	Schedule
Reduced overall costs to the GCHHS for high risk complex and comorbid conditions	1. Does the program reduce overall costs of delivering health care services for patients with complex needs? 2. What is the cost effectiveness of the GCIC program?	MBS costs: - benefit paid - patient contribution	Commonwealth Government, Department of Human Services	data range: 01/01/2014 to 31/12/2018
		PBS costs (for each class of medication): - patient contribution - net benefit		
		Emergency Department costs per episode	GCHHS	3 years retrospective and 12 monthly
		Inpatient costs per episode (based on AR-DRGs and costed using the National Efficient Price weights)		
		Outpatient visit costs (using the Tier 2 weights from the National Efficient Price)		
		Investigation costs incl. radiology and pathology		
		Quality of life (AQOL-4D)	holistic assessment	baseline and 12 monthly
		GCIC staff costs	GCIC human resources	annually
Improved health outcomes	1. Does the program improve health outcomes for high risk patients with complex needs? 2. What is the relationship between patient outcomes and clinical and demographic characteristics?	Quality of life (AQOL-4D)	patient questionnaire	baseline and 12 monthly
		Mortality	GCIC/GCHHS	annually
		Capability/wellness (ICECAP-O-5)	patient questionnaire	baseline and 12 monthly
		Social support (LSNS-6)		
		Number of falls		
		Blood pressure, Body Mass Index, smoking status and history, condition specific indicators (e.g. HbA1c, lipids) (intervention group only)	holistic assessment, GPr and GCIC data (Shared Care Record, Pencat)	baseline and 12 monthly
	Does the program change the proportion of costs shared by the	Number of Emergency Department attendances	GCHHS	3 years retrospective and 12
		Number of inpatient admissions (unplanned / emergency)		
		Number of GP visits	GPr data (Pencat)	

Objective	Research question	Outcome measure	Data source	Schedule
	primary and secondary care sectors?	Number of outpatient visits by specialty (new and review)	GCHHS	monthly
		Analysis of MBS/PBS data according to primary and secondary care	Commonwealth Government, Department of Human Services	data range: 01/01/2014 to 31/12/2018
Reduced number of potentially avoidable hospital admissions	Does the program reduce potentially avoidable hospital admissions and or presentations and length of stay?	Number of Emergency Department attendances	GCHHS	3 years retrospective and 12 monthly
		Number of inpatient admissions (unplanned / emergency)		
		Hospital inpatient length of stay		
		Number of outpatient visits by specialty (new and review)		
		Number and type of investigations e.g. radiology, pathology		
Improved patient satisfaction	Does the program improve patient experiences and satisfaction with care?	Patient satisfaction (SAPS-7)	questionnaire	baseline and 12 monthly
		Assessment of chronic illness care (PACIC-20)		
		Specifically designed open-ended questions (incl. acceptability of services) (qualitative method)	Focus Groups	Feb/March 2016, June 2017 (intervention group); June 2017 (control group)
Improved staff satisfaction	Does the program improve clinician experience and satisfaction?	Specifically designed GPr staff questions (incl. referral processes, communication with service providers) (intervention group only)	surveys (GPr nurse, GP, Practice Manager)	Sept 2015, June 2017, Dec 2018
		Specifically designed open ended questions (incl. barriers & enablers to implementation, change management strategies, acceptability of program, confidence) (qualitative method) (intervention group only)	Focus Groups	Sept 2015, June 2017, Dec 2018
To provide projected estimates of health service utilisation from	What are the projected changes in future numbers of admissions, emergency attendances, GP visits and other	Population projections: - age - gender - region	Australian Bureau of Statistics population trends	data range: 01/01/2014 to 31/12/2018
		Differences in rates of healthcare utilisation between intervention	GCIC	

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generalising the program for the Gold Coast and other metropolitan areas of Australia	healthcare utilisation based on generalising the GCIC program for the Gold Coast and other metropolitan areas of Australia for patients with complex needs over the five years from the end of the pilot?	and control groups: - Emergency Department attendances - inpatient admissions - GP visits - outpatient attendances		
To provide financial estimates for health budgets from generalising the program for the Gold Coast and other metropolitan areas of Australia	What are the forward estimates for the GCIC program for the Gold Coast, and expected costs of adapting the GCIC program to other metropolitan areas of Australia for patients with complex needs?	Population projections: - age - gender - region	Australian Bureau of Statistics population trends	data range: 01/01/2014 to 31/12/2018
To estimate any changes in the mix of the healthcare workforce required to provide integrated care should it be rolled out across the Gold Coast, Queensland and/or Australia	What are the additional types of staff requirements (including training needs) and staff displaced from generalising the intervention across the Gold Coast and other metropolitan areas of Australia?	- potential target population size - staffing ratios per participant - changes in healthcare utilisation across the different sectors and services	- Australian Bureau of Statistics population trends - GCIC - intervention staff needs assessment - estimates of changes in hospital and primary care services	data range: 01/01/2014 to 31/12/2018

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Improved clinical service delivery according to guidelines	To what extent does the program improve clinical service delivery according to guidelines?	Measures relating to diabetes annual cycle of care. Process outcomes: - proportion of patient population with HbA_{1c} tests completed - proportion of patient population with foot exams completed - proportion of patient population with eye examinations completed - proportion of patient population with blood pressure recorded - proportion of patient population with lipids tests completed - proportion of patient population with microalbuminuria tests completed - proportion of patient population with vaccinations completed in accordance with schedule - proportion of patients with smoking status recorded. Clinical outcomes: - proportion of patient population with $HbA_{1c} \leq 7\%$ - proportion of patient population with blood pressure <130/80 - proportion of patient population with total cholesterol <4mmol/L - proportion of patient population with LDL cholesterol <2mmol/L - proportion of patient population with microalbuminuria <2.5/3.5 mg/mmol (men/women)	GPr & GCIC data (Shared Care Record, Pencat)	3 month intervals
		Measures relating to chronic obstructive pulmonary disease. Process outcomes: - proportion of population with spirometry completed - proportions of patient population with vaccinations completed in accordance with schedule - proportion of patients with smoking status recorded - proportion of patient population with vaccinations completed in accordance with schedule - proportion of patients with smoking status recorded. Clinical outcomes: - proportion of patient population with current influenza vaccination		

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		- proportions of patient population with current pneumococcal vaccination - proportion of patients whom are non-smokers.		
		Measures relating to chronic kidney disease best practice guidelines. Process outcomes: - proportion of patient population with blood pressure recorded - proportion of patient population with eGFR recorded - proportion of patients with ARB or ACE medication prescribed - proportion of population with ACR recorded - proportion of patient population with lipids tested - proportion of patient population with vaccinations completed in accordance with schedule - proportion of patients with smoking status recorded. Clinical outcomes: - proportion of patient population with blood pressure ≤140/90 mmHg - proportion of patient population with lipids <4.0 mmol/L total, <2.5 mmol/L LDL		
		Measures relating to heart disease best practice guidelines. Process outcomes: - proportion of patient population with lipid lowering medication prescribed - proportion of patient population with anti-hypertensive medication prescribed - proportion of patient population with blood pressure recorded - proportion of patient population with lipids tested - proportion of patient population with vaccinations completed in accordance with schedule - proportion of patients with smoking status recorded. Clinical outcomes: - proportion of patient population with blood pressure ≤140/90 - proportion of patient population with LDL cholesterol <2mmol/L		
		Measures relating to service delivery (process outcomes):		

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		- number of GP management plans and reviews - number of Team Care Arrangements and reviews		
		Assessment of chronic illness care (ACIC-28) (intervention group only)	GP surveys	Sept 2015 and Dec 2018
To examine implementation fidelity	1. To what extent was the program implemented as intended? 2. How successfully were the strategies of the program implemented and conducted as planned?	Completion of risk stratification of patients: - method of patient identification (collaboration with GP, algorithm tool). Holistic assessments: - number completed - model of holistic assessment (incl. completed by whom) - type of risk assessment tools completed.	- risk stratification point criteria - review of GCIC protocols and manuals - holistic assessment monitoring database (daily reports) - GCIC quality audits	
To examine implementation determinants	1. What were the factors that facilitated and / or impeded program implementation? 2. Which elements of the program were seen to be most useful by staff and patients which contributed to outcomes?	Risk stratification: - number of patients identified - patient characteristics (incl. demographics). Services accessed: - number and type of services used e.g., allied health, home care, brokered services, hospital services. Holistic assessment outputs: - number of patient goals created - number of referrals - number of actions - number of live care plans. Shared Care Record: - number and type of consumer views on acceptability, usefulness, efficiency (client, GP, specialist). Disease registries: - number of disease registries implemented in GPrs - number of patients on disease registry. Governance arrangements: - leadership stability - organisational capacity	- administrative records - daily reports - holistic assessment monitoring database (daily reports) - staff focus groups - staff surveys and diaries - administrative data for use of components (revealed preferences)	

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		- adequacy of infrastructure, staff arrangement, partnerships, resources. Change management strategies Staff and skills training: - GCIC staff - GPr staff - other care providers. Program reach: - numbers and timeframe of GPr on-boarding - number of patients enrolled.		
Improved continuity of care	To what extent does the program improve continuity of care?	ACIC survey on management of chronic conditions in relation to the chronic disease model (network GPrs only)	questionnaire	baseline and at program completion
		Patients perspectives on continuity and coordination of care (qualitative method)	Focus Groups	2016 and 2017 (intervention group), 2017 (control group)

GCHHS = Gold Coast Hospital and Health Service; GCIC = Gold Coast Integrated Care; MBS = Medicare Benefits Schedule; PBS = Pharmaceutical Benefits Scheme; AR-DRG = Australian Refined Diagnosis Related Groups; AQOL-4D = Assessment of Quality of Life questionnaire; ICECAP-O-5 = Index of Capability for older people; LSNS-6 = Lubben Social Network Scale; GP = general practitioner; GPr = general practice; Pencat = Classic Clinical Audit Tool; SAPS-7 = Short Assessment of Patient Satisfaction questionnaire; PACIC-20 = Patient-Assessed Chronic Illness Care questionnaire; HbA_{1c} = glycated haemoglobin; LDL = low-density lipoprotein; eGFR = estimated glomerular filtration rate; ARB = angiotensin II receptor blocker; ACE = angiotensin converting enzyme; ACR = albumin-to-creatinine ratio; ACIC-28 = Assessment of Chronic Illness Care; [a] out of pocket costs are reported for MBS/PBS data only, and calculations exclude private health insurance, travel costs, loss of income and other non-healthcare costs;