

Telehealth substitution of rural outreach services: an economic analysis

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Abstract

The aim of this study was to identify how the cost of providing outreach services to rural and remote communities and Aboriginal and Torres Strait Islander (ATSI) people are affected through the substitution of some of these services with telehealth.

Using a case study approach, we compared the actual costs of providing face-to-face outreach clinics with the modelled costs of providing the same services using a blended face-to-face and telehealth service delivery model. CheckUP was the subject of our study. CheckUP, in partnership with the Queensland Aboriginal and Islander Health Council, is the jurisdictional fund holder of the Commonwealth Government's Outreach program funds that are used to provide a range of medical, allied health and nursing services to rural and remote communities and ATSI peoples. We modelled seven clinician reimbursement models and three rates of telehealth substitution. Models were stratified by health discipline.

Our modelling has shown that, in the context of outreach services for rural and remote communities and ATSI people, 13 of 16 health discipline services were less expensive to provide using a blended face-to-face / telehealth service model in at least one of the reimbursement models and telehealth substitution rate permutations. However, we also demonstrated that the introduction of telehealth may potentially increase the cost in other scenarios. Cost savings were observed to increase as the rate of telehealth substitution increased. The telehealth substitution rate at which costs savings were realised varied by discipline. Three disciplines never resulted in cost savings using telehealth substitution.

Our findings support the need for a case-by-case analysis (where local characteristics are considered) to determine the economic consequences of introducing telehealth.

Introduction

Telehealth is the delivery of healthcare at a distance using information and communication technologies. Healthcare providers use telehealth as an alternative method of delivering services which traditionally may have only ever been available face-to-face. In rural Australia, telehealth has been beneficial in enhancing local healthcare provision, reducing patient travel, and improving the timeliness of access to specialist care. (1) It is considered "best practice" to provide services using a combination of face-to-face and telehealth, as opposed to a complete replacement of face-to-face services.

Telehealth may reduce the cost of healthcare provision when avoided travel costs associated with outreach services are considered. The aim of this study was to identify how the cost of providing visiting outreach services may be affected through the substitution of some services with telehealth.

Methods

Using a case study approach (2) we compared the costs of providing face-to-face outreach clinics with the costs of providing the same services using a blended face-to-face / telehealth service delivery

model. For this study, we considered real-time, video consultations as the method of telehealth service delivery.

Context

Our study was done in collaboration with CheckUP, located in Queensland, Australia. CheckUP, in partnership with the Queensland Aboriginal and Islander Health Council, has jurisdiction of the Commonwealth Government's Outreach Program funds that are used to support a range of medical, allied health and nursing services to rural and remote communities and Aboriginal and Torres Strait Islander (ATSI) peoples. Typically, these services are provided by face-to-face outreach clinics.

Service data collected by CheckUP for routine administrative purposes was used to calculate the actual cost of providing face-to-face clinics. Twelve-months of service data from the 2014-2015 financial year were used. The service data included activity data and financial information. Financial data included outreach program specific allowances paid to clinicians (e.g. workforce support payment, professional support payment, administrative fees) as well as reimbursement for travel and travel expenses (e.g. accommodation, meals).

Input variables

The cost of providing services using a blended face-to-face / telehealth service were compared in our economic analysis. We created a number of cost models based on different telehealth substitution rates and clinician remuneration and reimbursement scenarios.

Our models were stratified by the discipline of the healthcare provider. We modelled the 16 healthcare provider disciplines (Box 1) that accounted for the top 50% of CheckUP services according to actual activity (number of outreach visits reported) and overall cost of providing the service.

Box 1 Disciplines included in economic model

Podiatry
Dietetics
Exercise physiology
Diabetes education
General practice
Psychology
Occupational therapy—paediatrics
Speech therapy—paediatrics
Physiotherapy
Nursing
Physician—Psychiatry—adult
Physician—General medicine
Physician—Dermatology
Health worker
Physician—Paediatrics
Speech therapy

Three telehealth substitution rates (25%, 50%, and 75%) were modelled. A 25% substitution rate means that 25% of outreach visits were substituted with a telehealth visit. Different rates of substitution were modelled to demonstrate overall effect of substitution rates on service costs. Since it is unlikely that 100% of outreach would be substitutable, we did not consider this option in our analysis. (3)

Seven clinician remuneration and reimbursement scenarios were considered in the modelling. These are summarised in Table 1. The Commonwealth Government's outreach program funds prescribe different types of payments to clinician. For example, — a workforce support payment compensates clinicians who would be financially disadvantaged (due to lack of Medicare reimbursement) by undertaking an outreach clinic. There is no workforce support payment paid to medical specialist in two of the scenarios (Scenarios 4a and Scenario 4b). This is based on the rationale that medical specialist are able to claim Medicare reimbursement to supplement their income, whereas general practitioners, allied health and nursing disciplines cannot presently claim Medicare reimbursement for telehealth consultations. A professional support payment compensates clinicians for informal support that arises from the outreach service (e.g. telephone or email support after the clinic). An administrative support payment compensates clinicians for administrative cost associated with the delivery of outreach series. In a number of the scenarios the average consultation time of a telehealth consultation was assumed to be half that of face-to-face consultation (Scenario 2b, Scenario 3b and Scenario 4b). This improved productivity was due to saved travel time. It was assumed facilities exist to host the telehealth consultation; hence, capital costs for telehealth infrastructure was not included in the modelling.

Costs are reported in Australian Dollars and from the perspective of the CheckUP.

Table 1 Clinician remuneration and reimbursement scenarios

	Workforce support payment	Professional support payment	Administrative support payment
Scenario 1	\$200 per day		\$80 per day
Scenario 2 (a)	\$120 per hour		
Scenario 2 (b)*	\$120 per hour		
Scenario 3 (a)	Allied health \$120 per hour; GP \$210 per hour; Medical specialist \$244 per hour		\$50 per day
Scenario 3 (b) *	Allied health \$120 per hour; GP \$210 per hour; Medical specialist \$244 per hour		\$50 per day
Scenario 4 (a)	Allied health \$120 per hour; GP \$210 per hour; No hourly rate for specialist	\$244 per day (specialist only)	\$110 per day (specialist only)
Scenario 4 (b)*	Allied health \$120 per hour; GP \$210 per hour; No hourly rate for specialist	\$244 per day (specialist only)	\$110 per day (specialist only)

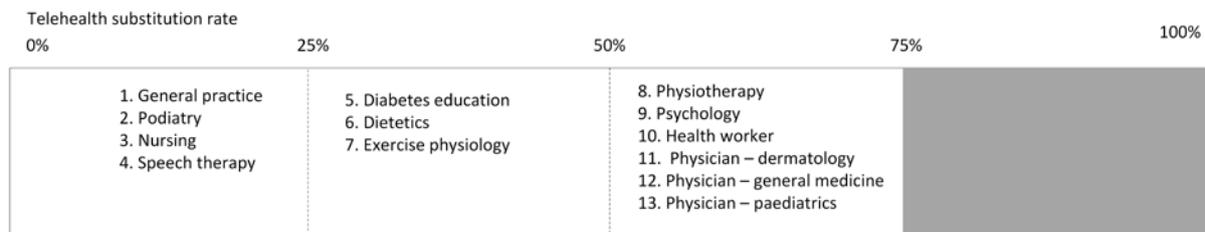
*Averaged duration of telehealth consultation is assumed to be half that of face-to-face consultation.

Results

A total of 21 economic models (three telehealth substitution rates and seven clinician remuneration and reimbursement scenarios) for each of the 16 healthcare provider discipline were developed.

Our modelling showed that 13 of the 16 healthcare disciplines were less expensive to provide using a blended face-to-face / telehealth service model in at least one of the remuneration and reimbursement scenarios and telehealth substitution rate permutations. The telehealth substitution rate at which costs savings were realised varied by discipline – some disciplines realised savings at less than 25% substitution rate; whereas, other disciplines only realised saving between 50% and 75% substitution rates (Figure 1). Three discipline (psychiatry, paediatric speech therapy and paediatric occupational therapy) did not realise saving under any of the modelled scenarios.

Figure 1 Telehealth substitution rate at which blended face-to-face/telehealth service delivery model was less expensive than face-to-face service delivery model



The resultant cost savings were observed to increase as the rate of telehealth substitution increased. For example, for a general practitioner under scenario 1, the costs savings at 25% substitution were \$732,000 (51%), at 50% were \$926,000 (65%), and 75% \$1,121,000 (78%). Cost savings for some other disciplines were modest when compared to general practice, for example, psychology only realised savings at a 75% substitution rate and only then for scenarios 1 (24%), 3b (6%) and 4b (6%). There were some scenarios when the use of a blended telehealth / face-to-face service delivery model increased the cost of providing services.

Discussion

We have identified that in some of the modelled scenarios for our subject organisation, savings can be realised using a blended telehealth / face-to-face service delivery model. Our findings are consistent with other studies that also reported mixed results on whether telehealth (specifically video consultations) resulted in savings. (4) The scenarios we identified as to when the use telehealth realised cost saving are not generalisable beyond the context of our study. The generalisability of economic evaluations in telehealth is often problematic due to different service models, health delivery systems and reimbursement schemes. (5) We also, identified that a blended service delivery model does not universally result in cost savings and in some scenarios the introduction of telehealth may actually increase the cost of providing services. The increased cost occurs when clinician remuneration and reimbursement exceeds the cost of saved travel. Hence, our study reinforces the need to examine services on a case-by-case basis to determine the economic consequences of introducing telehealth.

There is little, or nothing, published that quantifies discipline-specific telehealth substitution rates. Resultantly, we used a range of substitution rates in our modelling. The suitability and proportion of telehealth substitution for face-to-face consultations varies by specialty, complexity, and case mix and is most often determined by the clinician.(3) Depending on the discipline, some clinicians may find follow up consultations more amenable to telehealth, whereas complex cases that require detailed discussion and/or physical examination may be more appropriate for face-to-face outreach visits.

Our modelling has examined the economic implications of telehealth services from the service provider perspective. Gaining an understanding of the economics is one of a variety of important aspects associated with the introduction and provision of telehealth services for rural and remote patients in Australia. Other aspects such vision, ownership, adaptability, efficiency, workforce and infrastructure are all required for sustainable telehealth service delivery. (6) A further practicality that should be considered when planning telehealth services is the clinicians willingness to practice which was found by Wade *et al.* (7) to be the key determinant for the introduction of telehealth services.

Strengths and limitations

A strength of this study was the quality and comprehensiveness of data collected by CheckUP, which has resulted in accurate assessment of actual costs associated with service delivery. A further strength of this study is the pragmatic design.

There are several limitations to our study. We used a broad-brush approach by stratifying our cost models by discipline of health service provider. However, due to the heterogeneity of individual services within a discipline (e.g. mode of transport, distance travelled, activity, length of outreach visit) this approach may not be specific enough for individual services. Hence, more granular modelling, based on an individual service's costs and characteristics may provide a more accurate cost comparison of service delivery methods.

This study has only performed cost comparison of the different methods of service delivery and not considered wider implications of the introduction of telehealth services such as patient outcomes, accessibility, timeliness and responsiveness. Furthermore, health-care provider perspectives such as, increased safety resulting from reduced travel and acceptability of remuneration payments for telehealth have not been considered.

Conclusion

Our modelling has shown that in the context of outreach services for rural and remote communities and ATSI people, the substitution of a proportion of outreach visits with telehealth may reduce the cost of service provision in some scenarios. However, the introduction of telehealth may potentially increase the cost in other scenarios. The proportion at which telehealth substitution realises cost savings is health provider discipline specific. Cost savings were observed to increase as the rate of telehealth substitution increased. Our findings support the need for a case-by-case analysis (where local characteristics are considered) to determine the economic consequences of introducing telehealth.

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Presenter

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