Funding arrangements for telehealth: Encouraging efficiency rather than proliferation

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Abstract

The use of telehealth as a basis for delivering health services is growing across Australia, and there is clear potential for these technologies to address some of the enduring issues of access and costs of service delivery. However, appropriate incentives must be created to encourage clinicians and managers to evaluate the true opportunity costs and benefits of delivering services in this way against the relevant alternative. This paper examines how different funding arrangements might encourage or discourage efficient use of telehealth.

1 Introduction

Telehealth is already used across a wide range of direct and indirect clinical applications in the Australian health system, and the possibilities for new applications are almost as wide as clinical care. Telehealth can potentially address some of the enduring issues of access and costs of service delivery which arise in Australia because of geographical boundaries and uneven distribution of health care professionals. It could also lead to inappropriate substitutions, perverse financial incentives and resource allocation decisions driven by technological imperatives rather than appropriate assessment of costs and benefits. Telehealth further breaks down traditional service delivery funding boundaries. A systematic review of telehealth evaluations has indicated that it has potential to enhance care (Balas et al. 1997). However, it has yet to be determined whether telehealth will, in practice:

- encourage substitution from more to less resource-intensive modes of delivery
- encourage substitution rather than expansion of services
- encourage substitution to services of higher quality
- promote more acceptable service delivery for consumers and providers
- improve health outcomes
- meet gaps in service provision (for example, reducing waiting times or increasing access to specialised services).

The extent to which it can achieve these objectives depends largely on funding arrangements (Manson 1997). This paper considers how funding arrangements could be established to assist decision-makers in allocating resources and organising services to encourage efficient use of telehealth. Different telehealth funding models are examined in terms of their efficiency and appropriateness of provision in the Australian context.

Section 2 of the paper provides an overview of current and potential telehealth services. Section 3 outlines factors which are critical to assessing the value of telehealth. Section 4 outlines criteria for assessing different funding models. Four models of funding telehealth services are proposed in Section 5 and the assessment of them against the criteria is summarised in Section 6. Section 7 addresses the issue of the relationship between telehealth and private provision, particularly possible fee-for-service funding under Medicare, and Section 8 presents conclusions about appropriate funding models.

2 Overview of telehealth services in Australia

Telehealth refers to health delivery systems which allow for the provision of health care and related services between two or more different locations without travelling. It encompasses video-conferencing, medical image and data transfer and is being used in a range of applications across Australia, including mental health, pathology, radiology and dialysis (Brooks 1995; Wynn-Jones, Lewis & Groves-Phillips 1996; Yellowlees & Kennedy 1997).

Telehealth is a particularly applicable technology in Australia. Issues of distance and population density make it attractive as a means of enhancing services to rural and remote populations. It may also reduce barriers to access created by program and other boundaries, for example, between hospital and community-based care and between remote or rural management teams and tertiary referral centres. Most existing telehealth services have been set up to address the issue

of equitable access to services of an appropriate standard for rural and remote communities. These include clinical, legal, educational and administrative services. Some services are also addressing the issue of continuity of care, coordinated care or 'seamless' care by providing a means for establishing and maintaining a 'network' for delivering care (Yellowlees & McCoy 1993; Manson 1997; Yellowlees & Kennedy 1997).

There are a wide variety of organisational structures in place for telehealth. In some cases, there is a single video-conferencing link between remote locations. In others, one or more 'hubs', usually in a metropolitan area, are linked to a number of remote sites. Thus the exact administrative arrangements will vary across locations but, in all cases, the provision of telehealth needs to be supported by administrative and technical resources, as well as those resources involved in direct service provision (Yellowlees & Kennedy 1997).

Most telehealth services are currently funded by the relevant State or Territory health departments, either directly through specific grants or through additional funding to the 'host' hospital. In some cases, a combination of funding has been used to provide equipment or evaluate the new/enhanced service. Both Commonwealth Government (including Medicare incentive funding) and private sources have provided additional funding. In some States and Territories, telehealth is still regarded as being in a 'trial phase' and the grants which have been provided are on a pilot project basis (which may include funding for evaluation) (Manson 1997; Yellowlees & Kennedy 1997).

In general, the funding which has been provided for establishing and operating telehealth has been for providing the technology and for recurrent administrative and operational expenses. The service delivery itself may not be directly funded (that is, the costs of medical and other health service staff time), and is often covered from existing health service budgets, with no explicit accounting for this resource use. Funding arrangements vary across hospitals (for example, output-based funding or global budgets), but there are generally no specific arrangements for funding services delivered through telehealth.

3 Assessing the impact of telehealth

One option for funding and organising telehealth would be to take a laissez-faire approach and allow it to be incorporated into existing funding arrangements: either global budgets, casemix funding or other specific arrangements which exist at the State, Territory or regional level. However, this is unlikely to result in the best use of telehealth: some possibilities for its application will remain unfunded and the scope for over-utilisation in other areas is large. A number of issues need to be considered.

First, the full scope of resource use of telehealth must be correctly identified and attributed. This comprises not only establishment and equipment costs and administrative and maintenance support, both of which might be shared across a range of clinical uses, but also clinical and other resources (for example, educational) involved in providing telehealth. Because staff time and other resources from two locations will be involved, it will frequently be difficult to attribute the proportion of resources devoted to telehealth, and how these should be broken down across clinical, educational or administrative activity. Telehealth may save resources either through direct substitution for more costly modes of delivery or through better management, but it is also potentially very resource-intensive (Manson 1997).

Second, as telehealth is a means of transferring information rather than a service in itself, it has the potential to substitute for services across a wide range of existing publicly and privately provided services (funded through a range of different programs and with variable involvement of private insurers), both in hospital and out of hospital. Thus funding arrangements should, ideally, provide maximum flexibility for the use of the technology, without creating inappropriate incentives for cost-shifting, under-utilisation or over-utilisation. The relationship to fee-for-service Medicare funding is addressed in Section 7.

Third, while any resources freed up should be available to fund telehealth, in practice, the extent of realisable resource savings may be limited. The resources freed may be more readily diverted to another use. If telehealth provision allows for shorter lengths of stay for psychiatric patients, the resources released would only be available to fund telehealth if bed numbers were reduced – rather than throughput increased. Telehealth may save travel costs for clinical staff but, unless the transport budget is reduced rather than the resources redeployed, the savings will not be realised. There may be program and other boundaries which prevent the resource savings being used to fund telehealth. Many of the savings will be recurrent, but only realisable once capital outlays have been made. Resource savings may be distributed unequally across cost centres within and between hospitals and regions or across programs. Telehealth may reduce the costs of providing community ambulatory care (savings accruing to the Commonwealth through a reduction in Medicare-funded fee-for-service occasions of service) and increase costs of hospital services. Some of the savings will accrue to consumers.

Fourth, it has yet to be established that any resource savings (if they arise) will be sufficient to fund telehealth as a direct substitute for other forms of delivery of the same services. At least one evaluation has concluded that there are no net cost savings from telehealth (Halvorsen & Kristiansen 1996). Other studies have

demonstrated cost savings, although the basis for these claims is not always strong (Balas et al. 1997; Doolittle et al. 1997).

Finally, telehealth provision is not just concerned with reducing costs, but also with improving health outcomes (Williams, Remmes & Thompson 1996; Doolittle et al. 1997). It can increase access to specialist services for people in rural and remote locations. It may increase consumer and provider satisfaction with health services because of reduced waiting times, reduced travel costs, the capacity to receive treatment in a familiar setting with established social support networks, improved communications and more seamless management. It may improve health outcomes because of reduced delay in commencing treatment, access to higher quality care, enhanced continuity of care and increased availability of specialist follow-up.

Non-clinical applications also have the potential to improve the quality of health services provision. Telehealth may increase access to educational opportunities and peer support. As well as direct effects on quality of care, this may increase staff retention, particularly in rural and remote areas where this is an identified problem. However, all these service enhancements have an opportunity cost. They will need to be funded either by increasing the health budget overall or by reducing services in some other area. The key issue is to determine the value of the additional benefits, and to establish systems which make this explicit.

4 Criteria for assessing models

The following criteria have been established to evaluate the funding models.

Does the model encourage funding to follow activity and resource use?

A clear link between activity and resource use ensures that where substitution of one service for another has occurred, the substituted service is funded from the appropriate source.

Is the funding model flexible and robust?

Given that telehealth crosses program boundaries and that there are frequent changes in funding and organisational arrangements for health services, ideally, the proposed funding arrangements should be compatible with existing or possible funding arrangements for health services overall (for example, output-based funding or global budgets, purchaser–provider arrangements or needs-based population funding).

Is it compatible across different applications of telehealth?

Funding arrangements which are appropriate for an educational/training application may not be appropriate for a clinical application. Similarly, funding arrangements which are too closely tied to clinical activity may not be appropriate when there is a training/quality improvement objective of the service.

Does it minimise incentives for inappropriate expansion?

Funding arrangements for telehealth should not encourage inappropriate substitution or expansion of services which have no measurable health benefit – such as using telehealth when there is no possibility that the treatment decision would change.

Does it allow expansion to applications which improve access or outcomes?

In many cases, particularly in rural and remote areas, the improvement in access or outcomes will be a more important objective than cost reduction. However, it must be clear that this has been specifically identified as an objective of the health service.

Does it allow for appropriate research and development?

Once the telehealth infrastructure has been established in a location, possibilities for expansion to other applications should not be ruled out by the structure of funding arrangements. However, caution must be applied in assessing opportunity costs and benefits.

Does it encourage routine monitoring and evaluation of services?

Telehealth is still a developing technology and there are unanswered questions about its costs and benefits. New applications are likely to arise, and systems to improve the efficiency of existing applications are likely to develop.

Is it feasible, practical and efficient?

Appropriate funding arrangements will depend on the state of existing information systems and on other organisational issues such as arrangements for funding cross-border flows. Funding arrangements should not impose an undue administrative burden.

5 Funding models

Four general funding models for telehealth can be identified: mainstream funding; output-based payment; block grants; and cost and volume contracts. These models are not mutually exclusive but can be treated as conceptually distinct.

In a mainstream funding model, the funding of telehealth would be integrated with the funding of other health services. Establishment and capital costs of telehealth would be provided through the capital works budget or through usual avenues for enhancement funding (where they would be assessed against other enhancement bids). No specific recurrent funding would be provided.

In an output-based payment model, telehealth services would be funded on the basis of activity. The details of how an output-based payment model would be implemented require more in-depth discussion, particularly in terms of how outputs are classified. Specific arrangements may vary in terms of whether there is full or partial output-based reimbursement; the extent to which funding is capped; and across different clinical and related applications. Implementation would require detailed information about activity and resource use. Unless funding relates to appropriately defined outputs rather than other measures of activity, inappropriate incentives will exist. If funding were related to the number of services provided, there may be incentives to shift services inappropriately to telehealth, and no incentive exists to minimise the cost of telehealth provision for a given episode of care.

If adequate activity data were available, specific casemix classes or cost weights for telehealth could be developed and used as a basis for funding. Specific casemix classes might allow activity to be recorded and funded appropriately, particularly where telehealth substituted for another service. Algorithms for sharing the cost per case between the two sites involved in delivery would need to be developed. The relationship between activity and funding, and the incentives created, would depend on the specifics of the funding model (for example, whether it was direct case payment). However it would be difficult to avoid incentives for the originating hospital to shift activity to telehealth. Given that telehealth is generally a component of an overall episode of care, and is a substitute for traditional delivery, consistency in classification between the two modes of delivery is desirable. There are problems with creating separate casemix classes to cover essentially the same activity delivered in a different way.

The alternative is to develop telehealth cost weights within existing casemix classification systems. The cost weights would need to capture the full cost of delivering telehealth in both sites – although capital may be treated separately.

If the cost weights are to be used to allocate funding, detailed service weights for the different aspects of the services must be developed. While this adds a layer of complexity, the elements of telehealth delivery are essentially similar across most clinical applications – clinical staff involved at each site, administrative resources required at each site and the resources involved in the patient's usual care. Thus it is feasible to develop meaningful service weights. It is worth noting that the problems created by telehealth in terms of identifying an episode of care are not new – they are similar to those created by acute transfers between hospitals, or by cross-boundary flows for some specialist component of an episode of care.

Regardless of the details of output-based payment, problems may arise if there are two separate casemix 'prices' for the one class depending on how it is delivered. Unless it is possible to set the price differential to reflect exactly the cost differential to the originating hospital, there will be definite incentives to shift activity to telehealth. It is unlikely that such accurate costing could be achieved, given the relationship between marginal cost, average cost and revenue. There are also further complexities in determining how funding shares would be allocated between the two hospitals.

Under the third model, telehealth would be funded by providing block grants (a global fixed annual budget determined in advance) from the State/Territory to the region/hospital or from the region to the hospital. Under this model, hospitals/regions would prepare a case for establishing a telehealth service, which would be assessed against other service development requests. This would be provided initially as enhancement funding, with an adjustment to the global budget of the hospital/region to provide for recurrent costs.

The fourth possible model is a cost and volume contract model. Hospitals/regions would make a case for establishing a telehealth service, which would be assessed against other service development requests. Once the service has been established, it would be funded on a recurrent basis with a block grant relating directly to activity, that is, it would be built up on an output basis. Ideally, these agreements would be developed between the relevant regions/hospitals, although there is a case for States/Territories and/or the Commonwealth to be parties to the agreement. The agreement would specify the level of funding, sources of funding (for example, funds diverted from services for which telehealth is a substitute, service enhancements provided by a State health department), as well as the shares of funding between the hospitals/regions (and any other providers) involved. The funding would relate to an agreed level of service provision at an agreed cost, and the agreement would specify details of the type of activity, the quality of services and accountability requirements. Funding would be fixed for

a given level of activity, plus or minus some agreed level of variation. Adjustments may be necessary to allow for unanticipated variation in cost or activity beyond these limits, but this would require review and renegotiation. The amount of detail in the funding agreement would depend on the availability of appropriate activity, cost and outcome data. It is also worth noting that a cost and volume contract has similarities to an output-based payment funding arrangement in which total funding is capped.

6 Assessing funding models

The assessment of each funding model against these criteria has been made on a qualitative basis and is summarised in Table 1 and in the discussion below. In particular, the effects are discussed in terms of the impact on technical and allocative efficiency and equity of access to health services.

Mainstream funding

It is unlikely that this model will contribute to technical efficiency in providing telehealth. Funding is unlikely to follow resource use, there may be incentives for inappropriate cost-shifting, and there are no incentives for ongoing monitoring and evaluation. Similarly, there are no specific incentives to encourage the development of allocative efficiency in telehealth provision. Because telehealth is included in mainstream funding, equity of access issues are not addressed by the model. While mainstream funding appears initially to be easily implemented, given the nature of telehealth, particularly cross-boundary issues and inflexibility of program boundaries, it is unlikely to be feasible in practice.

Output-based payment

It is likely that this model will contribute in part to technical efficiency in providing telehealth because funding will follow resource use. However, there is no mechanism to discourage inappropriate expansion and, although there are strong incentives for routine data collection, it is not clear that this will automatically lead to monitoring and evaluation. It is unclear whether this funding arrangement will encourage the development of applications that increase equity of access. It is not feasible to implement this model of funding, given that information and accounting systems are not sufficiently advanced to support it.

Block grants

It is unlikely that this model will contribute to technical efficiency in providing telehealth. Funding is unlikely to follow resource use, there are no mechanisms to discourage inappropriate expansion, and there are no incentives for ongoing monitoring and evaluation. Similarly, there are no specific incentives to encourage the development of allocative efficiency in telehealth provision. It is unclear whether this funding arrangement will encourage the development of applications that increase equity of access. This model is feasible and readily implemented, given that appropriate funding sources can be identified.

Table 1: Assessing funding models against the desirable features

Desirable feature	Models			
	Mainstream funding	Output-based payment	Block grants	Cost and volume contracts
Funding follows activity	Possibly	Yes	No	Yes
Is flexible and robust	Possibly	Unclear	Yes	Yes
Is compatible across applications	No	No	Yes	Yes
Minimises incentives for inappropriate expansion	Unclear	No	Unclear	Unclear
Encourages improved access or outcomes	No	Possibly	Possibly	Unclear
Allows for research and development	No	Possibly	Unclear	Unclear
Encourages routine monitoring and evaluation	Unlikely	Possibly	No	Yes
Is feasible, practical and efficient	Unclear	No	Yes	Yes

Cost and volume contracts

This model is the one most likely to ensure that telehealth contributes to technical efficiency. The incentives for funding to follow resource use are weaker than in the output-based funding model, but if it is possible to identify the sources of funding, the model allows for a link between activity and funding. Depending on the specifics of the agreement, cost-shifting can be discouraged

and there are strong incentives to encourage monitoring and evaluation. It is unclear whether this funding arrangement will encourage the development of applications that increase equity of access, although this model does facilitate ongoing review of telehealth services against such criteria. Although it does increase the burden of administration and data collection, it is feasible to introduce this model as it is both compatible with other funding arrangements and across telehealth applications.

7 Telehealth and Medicare

Telehealth affects State, Territory and Commonwealth-funded health services, and the implications for Medicare fee-for-service funding need to be considered. Telehealth will often substitute for services provided by medical practitioners in the community and for inpatient services to private patients. These services are funded by the Commonwealth through the Medicare Benefits Schedule on an open-ended fee-for-service basis. As the development of telehealth technology expands, and given the overlap of public and private funding and provision in some clinical areas (particularly pathology and radiology, where there is potential for contracting), there are likely to be significant funding implications for all programs in the future. This raises the issue of how privately provided telehealth services (that is, telehealth provided by medical practitioners in their rooms or to private inpatients in hospitals) should be treated. There is a risk that if this issue is not specifically addressed, ad hoc and inappropriate funding arrangements will emerge. Further, providing telehealth in the public sector will create a demand for similar services in the (partially publicly funded) private sector.

There are two main options for reimbursing telehealth services provided by private providers in the community and in hospitals: including telehealth on the Medicare Benefits Schedule, with an appropriate reimbursement rate which reflects the costs; or providing specific grants to networks of providers, such as divisions of general practice, for providing telehealth. The latter could be a collaborative arrangement between hospitals and private providers.

While including telehealth on the Medicare Benefits Schedule has the advantages of ease of implementation and providing increased scope for existing telehealth facilities to be used, appropriate reimbursement arrangements must be established. The service provided by the medical practitioner is the same, but the associated costs will occur in two locations, and will be different from those for the same service provided face-to-face. The provision may be entirely within the private sector, or a private provider may use a telehealth facility funded and provided by the public sector to deliver a private encounter. In either case, the

reimbursement (from either government or the consumer) could be made to the provider, who would then be billed by the appropriate facilities for using the telehealth service (or, in the case that the facility is the provider's rooms, they are already responsible for the cost of its provision). It is worth noting that telehealth services have been included in the Medicare reimbursement schedules in the United States. Thus there is a precedent for such arrangements.

However, it is not clear that such an arrangement can be implemented without creating inappropriate incentives for using existing telehealth services or for expanding services. There is considerable potential for cost escalation and for duplication of services. Including telehealth on the Medicare Benefits Schedule also limits the role of the funder in assessing benefits and costs of services. There is no mechanism in such a system for the provider or the funder to determine whether it is worthwhile for a specific occasion of service to be provided by telehealth rather than by conventional means. Because telehealth is simply a means of delivering services rather than an intervention, it is not appropriate to rely on global and prospective assessments of its value, as might be appropriate for a particular medical procedure. Further, the incentive problems of a fee-for-service funding arrangement are widely documented, and will only be exacerbated by including telehealth (Donaldson & Gerard 1993).

Specific grants to groups of providers are more difficult to implement, but provide scope for integrating hospital and privately provided services, and for ongoing monitoring and evaluation. Cost and volume type contracts could be negotiated between the private providers (as a group or individuals), public providers and funders of services. For example, a rural-based general practice division or group of general practitioners could establish a telehealth link (either through the local hospital or within private facilities) with specialist services in a tertiary referral centre (for example, to provide support for obstetrics services). This represents an enhancement of services to the local community, but is more appropriately funded as a block grant than on a fee-for-service basis. A cost and volume contract would specify the nature of the service provided, and would apportion funding to the local providers and the referral centre.

Alternatively, private providers of specialist diagnostic or other services such as pathology or psychiatry could establish a telehealth link to provide services to rural and remote areas. These services would be likely to represent both an enhancement of access to such services and a substitute for existing services. For example, under conventional provision, the patient may have had to travel to a private provider in another location, the private provider may have travelled, or the local hospital/health service would have been responsible for ensuring that the patient had access to the appropriate services. In such cases, there is a complex

overlap between public and private provision and between Commonwealth and State or Territory responsibilities for funding. A cost and volume contract provides scope for sharing costs between the appropriate funding agencies and ensuring that costs are capped. The private providers would be funded to provide a specified level of service provision (for example, 20 consultations per month) plus or minus an agreed level of variation (for example, 5%). The contract would be most appropriately managed by the local hospital, which would be responsible for ensuring that the telehealth services were not duplicating existing services (for example, through arrangements with local general practitioners regarding referral mechanisms). The cost-sharing would be based on information provided by the parties involved about expected utilisation and current utilisation patterns. The provision of this information would be an essential component of any application for funding.

More generally, the establishment of such funding arrangements requires appropriate mechanisms for pooling resources across hospitals, regions, program boundaries and jurisdictions. For example, the current coordinated care trials have developed arrangements for pooling Commonwealth Medicare and State and Territory public hospital and other funds. Whether these arrangements are directly applicable to telehealth has yet to be established. Thus, to the extent that telehealth has implications for Commonwealth-funded programs, these would be best addressed through a coordinated State/Territory–Commonwealth approach and pooled funding arrangements, as in the cost and volume contract model. The problems with the inclusion of telehealth on the Medicare Benefits Schedule are too great.

8 Conclusion

Regardless of whether the telehealth funding arrangements to be established are between hospitals or between ambulatory care providers, or both, the best incentives for technical and allocative efficiency and equity are created by funding telehealth on the basis of cost and volume contracts. Although output-based payment has some attractive features, it is unlikely to be feasible at this stage. Cost and volume contracts provide the best potential for routine monitoring and review of services. While they require the development of good information systems, they can be implemented even with basic information.

Funding based on cost and volume contracts could be applied at a range of different levels, for example, between the State/Territory and regions, between regions, between regions and hospitals, between individual hospitals or between groups of providers and any of the above. Within broad parameters, individual hospitals or regions can establish their own funding and delivery agreements

between related sites. Thus the model encourages devolvement of responsibility for developing the agreements and funding the services to the regions or hospitals involved.

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