
Report prepared for the Ministry of Health

Review of Mobile Surgical Services and related services

Gary Blick, Preston Davies and Jo Esplin

14 July 2014

About Sapere Research Group Limited

Sapere Research Group is one of the largest expert consulting firms in Australasia and a leader in provision of independent economic, forensic accounting and public policy services. Sapere provides independent expert testimony, strategic advisory services, data analytics and other advice to Australasia's private sector corporate clients, major law firms, government agencies, and regulatory bodies.

Wellington Level 9, 1 Willeston St PO Box 587 Wellington 6140 Ph: +64 4 915 7590 Fax: +64 4 915 7596	Auckland Level 17, 3-5 Albert St PO Box 2475 Auckland 1140 Ph: +64 9 913 6240 Fax: +64 9 913 6241	
Sydney Level 14, 68 Pitt St GPO Box 220 NSW 2001 Ph: +61 2 9234 0200 Fax: +61 2 9234 0201	Canberra Unit 3, 97 Northbourne Ave Turner ACT 2612 GPO Box 252 Canberra City, ACT 2601 Ph: +61 2 6267 2700 Fax: +61 2 6267 2710	Melbourne Level 2, 65 Southbank Boulevard GPO Box 3179 Melbourne, VIC 3001 Ph: +61 3 9626 4333 Fax: +61 3 9626 4231

For information on this report please contact:

Name: Gary Blick
Telephone: 09 281 2130
Mobile: 021 107 1141
Email: gblick@srgexpert.com

Contents

Executive summary	1
1. Purpose and focus of the review	4
1.1 Purpose of the review.....	4
1.2 Focus of the review	4
1.3 Structure of this report.....	4
2. Overview of the services.....	7
2.1 Background and components	7
2.2 Funding.....	8
3. Our approach to the review.....	9
3.1 Qualitative approaches	9
3.1.1 Stakeholder interviews.....	9
3.1.2 Sampling patient views	11
3.2 Quantitative approaches	12
3.2.1 Service volume analysis	12
3.2.2 Economic analysis.....	12
4. Mobile surgery – service impacts.....	13
4.1 Service provision at multiple rural sites.....	13
4.1.1 Outputs – dental, endoscopy and general surgery dominate	14
4.1.2 Surgeon availability and patient safety determine the scope of services	16
4.1.3 Hospital capacity does not appear to be reduced	16
4.1.4 No major issues with referral pathways.....	17
4.1.5 No evidence of large differences in waiting times	18
4.1.6 Most rural sites are very happy to host the bus.....	18
4.1.7 Rural nurses are trained up and see wider benefits.....	19
4.1.8 Evidence of some good relationships in place	20
4.2 Impacts and outcomes – patients value the service highly.....	21
4.2.1 A focus on high-need populations in rural areas	21
4.2.2 Patients value the service most for its convenience	22
4.2.3 Staff on the bus were rated very highly by patients	23
4.2.4 Patient feedback to the provider is highly positive	23
4.2.5 What people liked the least about the service.....	24
4.2.6 Cultural needs – no issues were raised.....	25
4.2.7 Travel times to reach the bus tend to be short.....	25
4.2.8 A slight improvement in the rate of non-attendance	26
4.2.9 Patients reported improved well-being after surgery.....	28
4.3 Considering the counterfactual – what if there were no bus?	29
4.3.1 Most patients would travel further for their surgery	30
4.3.2 Up to 300 patients per year may not otherwise access surgery.....	31
4.3.3 Characteristics of patients who stated they would not travel further for surgery.....	31

5.	Mobile surgery – cost-effectiveness	33
5.1.1	The original contract was based on a business case	33
5.1.2	The current arrangements and a fluctuating “gap” between the contract price and national price.....	33
5.1.3	Factoring in rural hosting costs increases the gap.....	35
5.1.4	Delivery of volumes above contract reduces the gap.....	35
5.1.5	Considering avoided public subsidies for travel costs.....	36
5.1.6	Other perspectives on cost and efficiency	38
5.2	Some observations about value for money.....	39
6.	Rural professional development services	41
6.1	Service provision – training given locally	41
6.1.1	Rural sites choose their Continuing Professional Development sessions	41
6.1.2	Continuing Professional Development sessions are seen as relevant and engaging	42
6.1.3	The opportunity to link with local peers is valued.....	43
6.1.4	The telepresence experience is seen as high quality.....	43
6.2	Impacts and outcomes – a valued service	43
6.2.1	Evidence of some application of skills	43
6.2.2	Limited findings on recruitment and retention	44
6.3	Economic considerations of training.....	44
7.	Remote collaboration	46
8.	Concluding remarks.....	47
8.1	Mobile surgical services.....	47
8.2	Rural health professional development services	48
8.3	Remote collaboration services	49
8.4	Looking across the services.....	49
References		50

Appendices

Appendix 1 : Stakeholder interview list	51
Appendix 2 : Assessment of patient research against HDEC criteria	52
Appendix 3 : Script for securing informed consent from patients.....	54
Appendix 4 : Patient survey questions	56
Appendix 5 : Characteristics of patient samples.....	59

Tables

Table 1: Research questions guiding the review	5
Table 2: Summary of service descriptions	7
Table 3: Sampling patient views – summary of sample sizes	11
Table 4: List of regular rural sites, by district health board, 2012/13	13
Table 5: Selected comments from a sample of patient feedback forms	23
Table 6: Characteristics of patients who stated they would not travel further	32
Table 7: Contract prices and case-weighted discharge prices – a comparison	34
Table 8: Tests on the CWD price “gap” – summary of results	37
Table 9: List of stakeholder interviews	51

Figures

Figure 1: Funding by service component, 2006/07 – 2014/15	8
Figure 2: Profile of stakeholder interviews conducted	10
Figure 3: Mobile surgical discharges by financial year, 2006/06 – 2012/13	14
Figure 4: Mobile surgical discharges by health specialty, 2011/12 and 2012/13	14
Figure 5: Mobile surgical discharges by top 10 DRG codes, 2011/12 and 2012/13	15
Figure 6: Elective surgery day procedures, by age group, 2006/07 – 2013	21
Figure 7: Patient telephone interviews – what was valued most about the service	22
Figure 8: Patient travel time to reach the bus – self-reported	26
Figure 9: Rate of patient non-attendance, 2006/07-2012/13	27
Figure 10: Combined rate of patient non-attendance for 2011/12 and 2012/13, by site	27
Figure 11: Post-operative well-being reported by patients and caregivers	28
Figure 12: Whether patients would have travelled further for the service	30
Figure 13: Elective day surgery – performance against contract	36
Figure 14: Assessing the need for HDEC review – summary flowchart	53
Figure 15: Patient telephone interviews, distribution by age group	59
Figure 16: Patient mailed-back questionnaires, distribution by age group	60

Executive summary

The Ministry of Health commissioned us to conduct an independent review of mobile surgical services and the associated professional development and remote collaboration services. The purpose of this review is to understand the service processes, impacts and outcomes, and the economic dimensions associated with delivering these services.

We have employed a “mixed methods” approach, including visits to several rural sites, interviews with clinical and managerial staff at district health boards (DHBs), rural hospitals, primary care providers and community representatives. Patient and caregiver views were obtained via a telephone interview, a postal survey and service feedback forms. We also examined service volume and available financial data. The emphasis has been weighted towards the mobile surgical service, which is the service that receives most of the funding.

The mobile surgical service improves access for rural patients

There is sufficient evidence to conclude that the mobile surgical service improves access for rural patients, and in particular, those patients who are from groups that tend to have high health needs, suffer from health inequalities, and /or face barriers to accessing care.

- The patients tend to be children and young people (41% of discharges) and people aged 60 years and over (27% of discharges), although this level of access is enabled by the mix of services offered on the bus (e.g. dental, endoscopies). Also of note, patients who identify as Māori comprised 24% of discharges – around 6 percentage points higher than their share of the rural population. These patients have been assessed by their DHB as meeting the threshold for surgery and so the mobile service can be seen as helping to support their access to care.
- Although most of the surveyed patients stated that they would have travelled further for surgery (e.g. to their base hospital), around 20% stated that they would not have travelled further. This figure is not insignificant and implies that up to 300 rural patients per year, who have been prioritised for surgery by their DHB, may not otherwise access the care they need. Reasons cited by these patients include: no access to transport; too costly to pay for transport, food and accommodation; and issues around child care.
- Stakeholders at rural host sites tended to comment that, if there was no mobile service, then they believed that some patients would not be able to travel further to a base hospital for surgery. These stakeholders – including general managers at several rural hospitals, rural nurses, a clinical manager at a hauroa provider and a rural general practitioner – typically referred to children in struggling families or older people and cited barriers such as a lack of transport and/or money, and the distance involved.

Patients and caregivers generally report highly positive experiences

Patients and their caregivers overwhelmingly perceive their experience of the mobile surgical service to be a positive experience. There is strong evidence that rural patients and their caregivers value the “convenience” of the service being close to home. This term was used to cover reduced travel time or direct travel costs, not having to take time off work or make alternative child care arrangements, and avoided stress or apprehension. The majority of patients also reported that they have experienced improvements in their wellbeing following their surgery on the bus. Consistent with this, none of the clinical staff involved expressed any concerns about the current scope of procedures being performed or the follow-up care. No concerns were raised about the safety or effectiveness of the service.

The sector appears to be broadly comfortable with the mobile surgical service

DHBs that we spoke with seemed satisfied that the referral pathways and waiting times for the mobile surgical service did not place rural patients at any systemic or material disadvantage, relative to their non-rural counterparts that live closer to a base hospital (or vice versa). The bus was seen as a small but useful supplementary capacity that can help DHBs to manage the reduced targets for patient waiting times for elective surgery. To put this in context, that capacity is the equivalent of one additional day surgery list per month for most host DHBs, and up to one extra list per week for DHBs with multiple hosting sites.

In most cases, the rural hospitals and their communities welcome the bus and the chance for local nurses to work on board. A number of rural sites mentioned that the bus is seen in the community as a replacement for earlier loss of surgical services, following the centralisation of elective surgery during the 1990s.

Service cost-effectiveness is difficult to pin down

We explored options for conducting a cost-effectiveness analysis of the mobile surgical service, relative to delivery at a base hospital. Ultimately, this was not possible because we were unable to obtain sufficiently detailed financial data from the provider or DHBs. However, our partial insights into the prices and volumes of the mobile surgical service suggest that it is plausible that MSS Ltd is operating as cost-effectively as the alternative of base hospital delivery, once the effective contract price is adjusted to take account of improved access, over-delivery of volumes, and avoided costs. This view is offered without fully knowing the cost structures and whether there is ongoing cross-subsidisation from the professional development and remote collaboration services towards the surgical service.

Arguably, if the mix of cases is oriented towards planned and low complexity day surgery, it might be expected that the mobile service should be more cost-effective than a base hospital – particularly for a nimble provider that contracts in specialists without facing overheads, such as the professional development requirements of salaried clinical staff.

We were advised by the provider that the pre-tax return on the cost value of the asset base employed in the business for 2012/13 was 11.5% (or a post-tax return of 8.3%). We note that, arguably, this return appears to be on the high side. However, we offer these figures without having conducted a detailed appraisal the company accounts.

Signs point to a well-run service but value for money is ultimately a judgement

The bus reliably turns up at two dozen sites on a regular five-week cycle, largely without incident. Furthermore, the staff employed or contracted by MSS Ltd were seen by stakeholders as “flexible” and willing to discuss other approaches, while patients and caregivers generally rate their experiences with staff very highly. This all suggests that, operationally, the mobile surgical service is well planned and managed.

We would conclude that the mobile surgical service largely fulfills the objectives set out in the contract – of providing access to a (reasonably) wide range of day surgical procedures in rural communities in a timely way. In doing so, there is evidence that it is improving access to elective surgery for patients in rural communities and assisting DHBs to, at the margin, meet their key performance indicators for elective surgery.

The question of whether the cost of this improved access service (\$4 million per annum) is justified is a judgement. It requires an overview of how else this funding could be used to support access for these patients or a similar group for different bundle of services. This is something an informed and strategic funder is best-placed to consider.

Professional development training is seen as relevant and engaging

Participants were uniformly positive about the relevance and quality of the content of these telepresence-based sessions, which form the largest volume of professional development services. Some participants highlighted occasions where they felt the topic or presenters had been tailored to their rural context and understood the needs of rural staff. The sessions also appear to enable local networks, as the training is open to all providers located at a rural site.

There is some evidence that the skills are being applied, with rural nurses commenting that the training on patient airway management and resuscitation skills would be useful in their roles on medical wards or emergency departments. GPs appreciate the chance to spend time onboard the bus with a specialist, to develop practical skills (e.g. minor surgery, intubation).

The training may not be material for recruitment and retention in rural settings

We did not find managers arguing that the training sessions or opportunities to work on the bus are material factors in their nursing workforce recruitment or retention. A couple of managers commented that the nursing roles in their rural hospitals tend to be settled and typically sought-after. Balancing this, two organisations did comment that they valued being able to offer training aboard the bus to their general practitioners. In one case, it may have helped with the recruitment of doctors to work in a rural hospital setting.

The remote collaboration service has had to be refocused

We understand that it has proved difficult to bring sufficient clinicians on board for the remote collaboration service. This service had envisaged, for example, clinician collaboration over mortality reviews, difficult diagnoses, and surgical observations. Instead, the focus has shifted to areas where there is scope to use the technology, such as supporting rural participation in conferences and medical student immersion in rural settings. As much of this activity is part of a broad “rural training/education” theme, it might make sense to consider funding and reporting for one component covering all professional development activities.

Looking across the services

Looking across the services we found some signs that they are consistent with the objectives of service integration articulated under the “Better, Sooner, More Convenient” initiative.

- Rural patients, often from relatively high-need groups, are able to access elective day surgery in a way that is closer to home and “more convenient” for them;
- Some new patient pathways being supported by the presence of the mobile surgical service, for example, a rural GP with a “special interest” being approved by a DHB to handle first specialist assessments and recommend referrals to the mobile service.
- Specialists are sharing knowledge to enable patients to be better managed within the community, for example by advising on the delivery of minor surgery in a rural medical centre how to manage patients who do not meet the threshold for outpatient referral.

The professional development and remote collaboration services appear to fit together in that both services tend to use the same telepresence capability and networks of people. The surgical service could be seen as separate, as the telepresence function does not appear to be used, other than for surgical demonstrations – which could happen at any base hospital. Nevertheless, there may be some efficiency to be gained from having the surgical and telepresence components delivered by same provider (e.g. shared corporate overheads).

1. Purpose and focus of the review

1.1 Purpose of the review

The Ministry of Health commissioned this independent review of mobile surgical services and the associated professional development and remote collaboration services. The purpose of this review is to understand the **service processes, impacts and outcomes**, and **economic dimensions** associated with delivering these services.¹ In addressing these dimensions, this review has been guided by the questions provided by the Ministry of Health, as laid out in Table 1, overleaf. The review's conclusions are intended to inform future decisions about these services.

1.2 Focus of the review

Mobile Surgical Solutions Ltd is contracted to provide three service components and all three services are within the scope of this review:

- Mobile surgical services – elective day surgery in selected rural communities;
- Rural health professional development services; and
- Remote collaboration services – using telepresence to enable clinical networking.

Our research focus has been weighted towards the mobile surgical service, which is the component that receives the majority of the funding (71%). This focus is consistent with the expectations of the Ministry of Health, as the funder of the service. The Ministry indicated that although qualitative approaches would be needed to obtain stakeholder views about each service component, there would be particular interest in hearing patient views about the mobile surgical service, for example, the value they place on being able to be treated and to recover within their community. These are views that may not otherwise be easily accessed.

1.3 Structure of this report

This report has been structured into three service areas: mobile surgical services, profession development services, and remote collaboration. As far as possible, those chapters are guided by the three high-level dimensions identified by the Ministry of Health – service processes, impacts and outcomes, and economic considerations. The bulk of material relates to the surgical bus, as it accounts for most of the funding and is, by far, the most complex service.

In reporting our qualitative research findings, we focused on dominant themes and clear clusters of views. We also looked to ensure alternative or minority views are represented. The findings were filtered to focus on supply-side processes and capacity, stakeholder impressions, patient /participant access and impressions; and key enablers of the outcomes.

¹ Ministry of Health (2013) *Request for Tender (RFT)* 4 April 2013

Table 1: Research questions guiding the review

Components	Mobile surgical services	Rural health professional development services	Remote collaboration services
Service processes	<ul style="list-style-type: none"> Service delivery: Describe the activities that form part of the three service delivery components? In each service delivery component, how do staff identify what will be delivered? What is the nature of partnerships required and developed, that is with District Health Boards, health professionals, communities and other organisations? Reach: To what extent is the target population being reached, that is number and types of patients/communities? How does access to service components happen? How are communities, patients, health professionals identified for inclusion into the service? How do they experience/rate the service? Staffing: How are employees trained to deliver the service? 		
	<ul style="list-style-type: none"> Describe and analyse the effective processes used to deliver appropriate volumes and specialties. 	<ul style="list-style-type: none"> Describe and analyse the effective processes used to deliver appropriate volumes and types of rural health professional development services. 	<ul style="list-style-type: none"> Describe and analyse the effective processes used to deliver appropriate telepresence systems and services to support remote collaboration and clinical networking and professional development.
Service impacts and outcomes	<ul style="list-style-type: none"> Target audience: Did participants experience changes in their skills and knowledge? What was the perceived value of the programme by health professionals and clients? Impact: What changes were expected (outputs and short/ medium/long-term outcomes)? What changes actually happened? What are the facilitators for the implementation of the service? Were there any positive and/or negative unintended impacts of the service? What are the challenges to implementing the service? How are the barriers addressed? What could be the long-term impact of this service? Does the service reduce health inequalities for rural populations and for Māori and Pacific peoples? What could have been done differently to be more effective? Were the resources and inputs sufficient to achieve the goals/objectives of the services? What are the lessons learned for the future? How do the services meet the objectives of service integration according to “Better, Sooner, More Convenient”? How can the services be changed and developed to meet the objectives of “Better, Sooner, More Convenient”? 		
	<ul style="list-style-type: none"> What is the impact of on equity of access to elective day surgery for rural patients and communities? Is the mix of procedures appropriate for the needs of communities, as identified by DHBs and MoH? 	<ul style="list-style-type: none"> Are the services contributing effectively to the continuing education, support and retention of the rural health workforce? 	<ul style="list-style-type: none"> Are the remote collaboration (telepresence) services enabling rural health professionals and, tertiary and secondary/provincial hospitals to use national linkages for clinical networking and support?
Economic considerations	<ul style="list-style-type: none"> Are the mobile surgical and related services a cost-effective approach to rural health service delivery? 		
	<ul style="list-style-type: none"> Are the benefits greater than the costs of alternate treatment, e.g. hospital-based treatment, including travel and other associated costs Identify and describe non-financial benefits such as patient/family/community/social benefits of day surgery in rural communities, e.g. access to FSAs, treatment closer to home, community cohesiveness. 	<ul style="list-style-type: none"> Are the benefits of these services greater than the costs of alternate/traditional means of delivering health professional development, remote collaboration/telepresence and clinical networking for rural health professionals? Identify and describe any non-financial costs and benefits, eg applying to patients, families and communities. 	

Source: Ministry of Health

2. Overview of the services

2.1 Background and components

The Ministry of Health contracted Mobile Surgical Solutions (MSS) Ltd – a limited liability company based in Christchurch – to commence providing day surgery from a mobile surgical unit in 2002. The unit is a 20 metre long truck and trailer known as ‘the bus’.

The Ministry of Health entered into a new contract with the provider on 1 November 2006. The description of the three service components is summarised in Table 2. A variation to the contract in June 2012 extended funding for the services until 30 June 2015.

Table 2: Summary of service descriptions

Service component	Description
Mobile surgical services	<p>Elective day surgeries, provided in a mobile surgical bus, and provide to rural communities (unless otherwise agreed).</p> <p>The procedures should aim to be from specialties and DHB areas where additional capacity is most needed to address inequalities in access to day surgery by rural populations.</p> <p>The services must be able to link with existing health providers to ensure integration between mobile surgical services and existing health services.</p>
Rural health professional development services	<p>Professional development services to registered health practitioners servicing rural communities.</p> <p>Surgical skill training to GPs and nurses.</p> <p>The services must be recognised for continuing education purposes by the relevant registration authorities or contribute towards the achievement of an accredited qualification.</p>
Remote national and international collaboration services	<p>National and/or international collaboration via remote linkages to provide clinical support and training and secondary and tertiary hospitals and educational institutions.</p> <p>The linkages, via, telepresence technology, will allow surgical or medical teams access to expert assistance and the introduction of new ideas and technologies.</p> <p>The linkages will provide remote location peer support that will enable surgical or medical teams working in one geographic location to be visually supervised or collaborate and interact with colleagues in another location.</p>

Source: Service contract 488412 / 308410-00

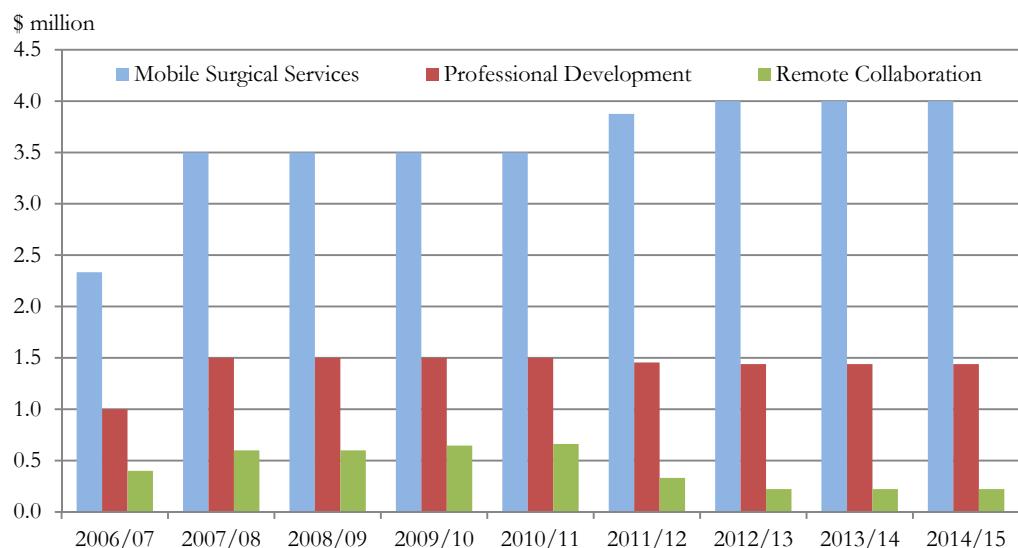
The contract specifies a series of service objectives, namely, that MSS Ltd will ensure that it:

- Offers timely and community based access to a wide range of day surgical procedures in rural communities, thereby improving access to elective surgery for patients in rural communities and assisting district health boards to meet their elective surgical services key performance indicators;
- Provides training and professional development to rural health practitioners to assist in:
 - Improving health practitioners' access to surgical and/or advanced skills
 - Maintaining clinical and competency learning
 - Enabling a more flexible workforce within relevant scopes of practice, and
 - Reducing staff turnover;
- Supports maintenance and development of rural health services, and enhances the integration of primary health services with secondary care activities;
- Provides access to high-cost surgical equipment in rural communities at marginal cost;
- Provides clinical support services for secondary and tertiary hospitals and educational institutions via remote linkages.²

2.2 Funding

The current contract, which began midway during 2007/06 as a five-year contract, runs until 2014/15. Annual funding is set at \$5.6 million, with the main changes being an increase of \$61,000 in 2010/11 and a reallocation of \$500,000 to the mobile surgical component. The mobile surgical service is allocated \$4 million (71%), with \$1.44 million (25%) for rural health professional development and \$222,000 (4%) for remote collaboration services.

Figure 1: Funding by service component, 2006/07 – 2014/15



Source: Service contract and contract variations

² Service contract 488412 / 308410-00, p.3

3. Our approach to the review

The review was conducted over the period December 2013 to February 2014. We employed a range of qualitative and quantitative research methods, as follows:

- a targeted review of key publications and relevant background documentation;
- a series of site visits including:
 - a day with the provider, Mobile Surgical Services Ltd, at their premises in Christchurch. In addition to staff interviews and presentations, the visit included tele-presence interviews with managerial staff at Te Puia Hospital and Dannevirke Community Hospital, and an observation of a tele-presence tutorial in action;
 - visits to four rural hospitals that host the mobile surgical and education services – Dargaville Hospital (Northland DHB), Pukekohe Hospital (Counties Manukau DHB), and Gore and Oamaru Hospitals (Southern DHB). The visit to Oamaru Hospital allowed for an observation of the mobile surgical unit in action;
- interviews with a range of stakeholders, including clinical staff delivering the services, participants in education sessions, rural hospital managers and administrators, DHB service managers and coordinators, general practitioners, a hauora provider, educators and community group representatives;.
- sampling patient views of the mobile surgical service using a combination of telephone interviews, a mailed-out questionnaire, and patient feedback forms held by the provider;
- a small number of opportunistic conversations with clinical and non-clinical staff in the health sector to hear their impressions of the mobile surgical service;
- analysis of service delivery data, including the volume and mix of surgical procedures and the demographic characteristics of the patients; and
- analysis of available financial data associated with the services with the aim of obtaining insights into the relative cost-effectiveness of the mobile surgical service.

3.1 Qualitative approaches

3.1.1 Stakeholder interviews

We conducted interviews with 34 stakeholders, selected from a lengthy list of sector contacts supplied by the provider. In some cases, we were referred on to other relevant stakeholders. In selecting the interviewees, we sought to gain a mix of clinical, managerial, and community representatives from a range of districts. In particular, we sought out clinical and managerial perspectives on the quality and safety of the mobile surgical services and the appropriateness of the service mix. We were also guided by a set of pre-agreed selection criteria, namely:

- direct experience – the individual has direct experience of the service;
- sufficient mandate – the individual has a mandate to represent the views of others; and
- alternative views – the individual is likely to offer a minority or seldom-heard viewpoint.

The interviews were ‘semi-structured’ in that we were guided by some standard questions, while also allowing interviewees enough space to convey their points in their own way. Our approach involved the following steps:

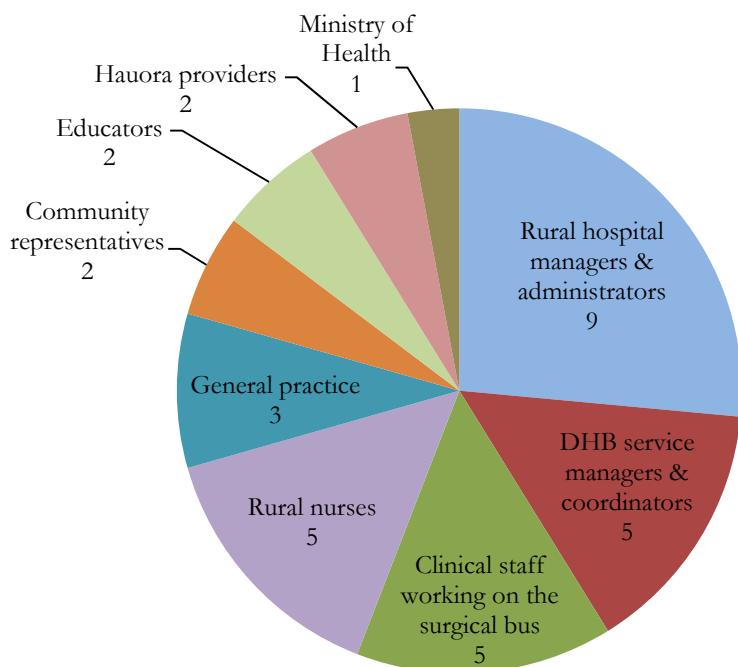
- develop sets of standardised questions to guide the interviews;
- validate interview notes by reflecting back to the interviewee;
- code and group responses; and
- analyse the themes and test with the story emerging from quantitative-based analysis.

The majority of these interviews – 22/34 or 65% – were conducted in person, with the remainder via a telepresence link or telephone. The in-person interviews were typically conducted during the site visits. The advantages of this approach are that we were able to view the environment, conduct longer and more in-depth discussions.

A profile of stakeholder interviews is shown in Figure 2. The interviews covered: managers and administrators at rural hospitals that support the delivery of the surgical and professional development services; service managers and coordinators at (three) DHBs; clinical staff that work on the bus (e.g. surgeon, anaesthetist, anaesthetic technician, and charge nurse); rural nurses that support the surgical service and/or participate in the professional development service; community representatives; rural general practices; educators, hauora providers; and a Ministry of Health official.

Locations represented in these interviews include Dargaville, Pukekohe, Opotiki, Te Puia Springs, Dannevirke, Levin, Oamaru, Dunedin, Balclutha and Gore. A summary list of interviews is attached as Appendix 1.

Figure 2: Profile of stakeholder interviews conducted



Source: Sapere Research Group

3.1.2 Sampling patient views

Three approaches were used to obtain direct input from patients and secondary sources.³

- **Patient telephone interviews** – we interviewed 28 patients and caregivers. The provider's follow-up nurse sought informed consent during the 30-day call to 37 patients who had surgery during November and December 2013. The contact details of consenting patients were provided to Sapere Research Group, of which 28 were able to be contacted, checked for consent and interviewed. The script used to obtain informed consent is attached as Appendix 3. The interview questions are attached as Appendix 4.
- **Patient postal survey** – a questionnaire was drafted by Sapere Research Group and sent out by the provider for reasons of confidentiality and informed consent. A letter seeking informed consent invited replies to be posted to Sapere (a stamped envelope was included). The questionnaire was sent to 162 patients (or caregivers) who had received surgery during 2013. The responses numbered 43 or a rate of 27%.
- **Sample of patient feedback forms** – the provider gives patients hard-copy feedback forms on their day of surgery. Between June 2012 and May 2013, 690 forms were received from 1,558 patients – a return rate of 44%. The forms were given to Sapere, from which 150 were randomly selected and analysed in a spreadsheet. The forms covered patients from a range of locations but did not include demographic details.

In total, the qualitative experiences of 221 patients were gathered across the three methods. The demographic characteristics are summarised in Appendix 5.

The potential limitations of the sample of telephone interviews should be noted. Time constraints meant that informed consent had to be sought via the 30-day patient follow-up call, and so this meant the sample was skewed to those with recent experiences. The sample was also skewed towards caregivers of children under the age 16 years, who formed 20/28 or 71% of interviewees. Furthermore, 18/20 of these children had received dental surgery. Nevertheless, we do not believe that the robustness of the interviews was compromised, given the consistency of the results with those obtained from the other two methods.

Table 3: Sampling patient views – summary of sample sizes

Indicator	Patient telephone interviews	Patient postal survey	Patient feedback forms
Sample size (n)	28	43	150
Response rate (%)	76% (28/37)	27% (43/162)	22% (150/690) ¹

Source: Sapere Research Group

1. Not strictly a response rate; sampled from forms received by the provider over a 12-month period.

³ We assessed our research against the criteria of the National Health and Disability Ethics Committee and concluded that an HDEC review was not required for this project. Our analysis is attached as Appendix 1.

3.2 Quantitative approaches

3.2.1 Service volume analysis

Data on the volumes delivered under the services was made available by MSS Ltd through an online portal. We analysed the data for patterns and trends. The key data elements identified for the mobile surgical service were:

- discharges by hospital site, health specialty and diagnostic-relating group (DRG);
- patient demographic information, including sex, age and ethnicity;
- patients who did not attend their surgical appointment (“no shows” or DNAs); and
- the number of surgical days per year.

We used this data for a number of purposes, for example, to build a picture of performance against contract and to inform our consideration of patient access to the mobile surgical service. To that end, we estimated the rate of “did not attends” for the mobile surgical bus and compared that with average rates across district health boards. We also considered whether the service helps to reduce health inequalities for Māori and Pacific peoples, by examining discharges by ethnicity and comparing the representation of those groups with their representation among estimates of the rural population.

3.2.2 Economic analysis

We explored options for conducting a formal cost-effectiveness analysis of the mobile surgical service. The aim was to gain insights into the costs of the current service, relative to a plausible alternative service that would deliver equivalent health outcomes. Ultimately, this approach proved to be not possible because we were unable to obtain sufficiently detailed financial data from the provider or district health boards.

Instead, we look at ways to glean insights into cost-effectiveness from some observations, partial metrics, and the contract currently in place. This approach is necessarily descriptive rather than numerical in emphasis. The current contract, which outlines prices and volumes, is a key source of information, along with actual volumes delivered and the extent to which the contract has been fulfilled. We examine the “gap” between the effective unit price in the provider’s contract in relation to the national case-weight price used by DHBs, and how this has changed over time. We also consider information on the actual and avoided costs borne by the health system and patients and how this affects this unit price “gap”.

4. Mobile surgery – service impacts

4.1 Service provision at multiple rural sites

The mobile surgical bus runs on a five-week cycle and operates at around 24 sites in a year. The sites are mostly rural hospitals that are owned and operated by a district health board or a community trust, along with a small number of medical centres. The bus is regularly hosted in 15 out of 20 districts, with the exceptions being Auckland, Bay of Plenty, Hutt, Lakes and South Canterbury. Table 4 lists the regular sites and shows that nine boards have a single site with five having two sites. Southern DHB, previously Southland and Otago, has five sites.

The national circuit comprises five sections, as outlined below. A team of charge nurse, anaesthetic technician, and anaesthetist travels with the bus and meets up with the scheduled surgeon at each stop, depending on the specialty agreed with the district health board. A team of four nurses is sourced at each stop, usually from a rural hospital or medical centre.

- Week 1: Kaikohe, Dargaville, Warkworth, Pukekohe, then maintenance at Rotorua
- Week 2: Te Puia, Wairoa, Waipukurau, Dannevirke, Taihape
- Week 3: Waikari, Ashburton, Oamaru, Balclutha, Gore
- Week 4: Queenstown, Dunstan, back to Christchurch to re-stock and conduct maintenance, then Buller and Takaka or Motueka (alternate sites)
- Week 5: Featherston, Kapiti, Levin, Hawera and Taumarunui

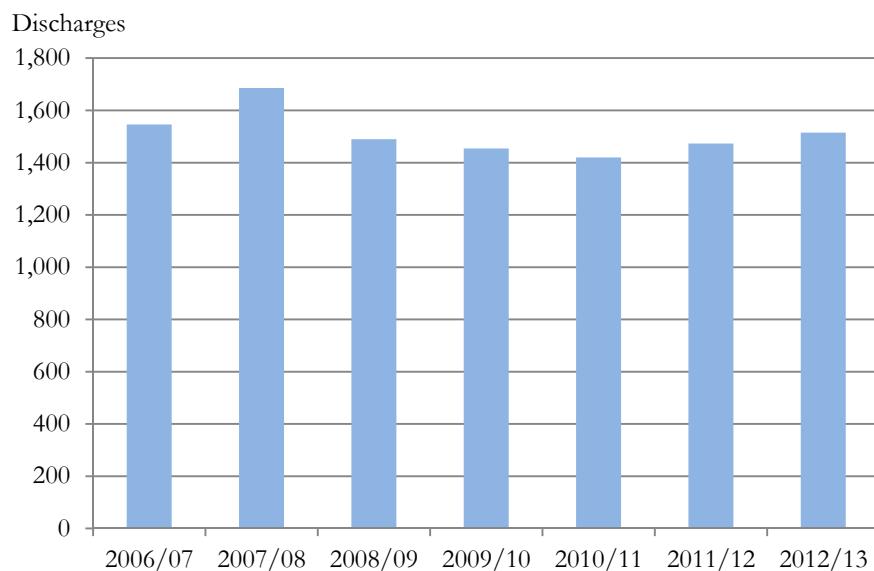
Table 4: List of regular rural sites, by district health board, 2012/13

District Health Board	Rural sites hosting the surgical bus
Canterbury (2)	Ashburton, Waikari
Capital & Coast	Kapiti
Counties Manukau	Pukekohe
Hawkes Bay (2)	Waipukurau, Wairoa
MidCentral (2)	Dannevirke, Levin
Nelson Marlborough (2)	Motueka, Takaka
Northland (2)	Dargaville, Kaikohe
Southern (5)	Balclutha, Dunstan, Gore, Oamaru, Queenstown
Tairawhiti	Te Puia Springs
Taranaki	Hawera
Waikato	Taumarunui
Wairarapa	Featherston
Waitemata	Warkworth
West Coast	Buller
Whanganui	Taihape

4.1.1 Outputs – dental, endoscopy and general surgery dominate

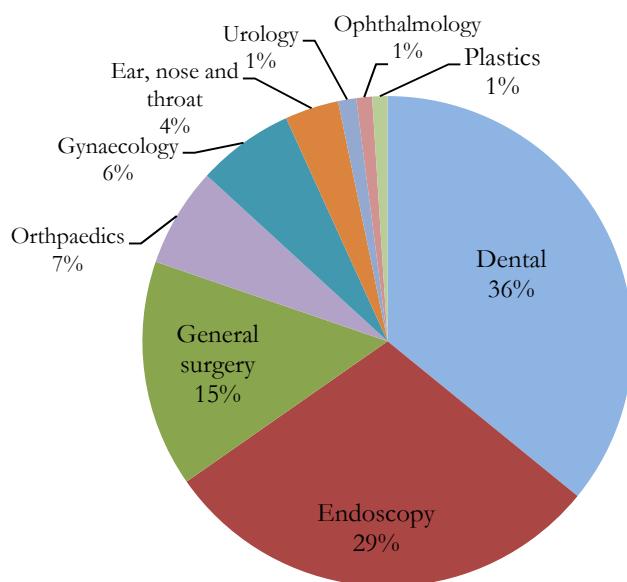
The mobile surgical service delivers around 1,500 elective day surgery discharges per year. Figure 3 shows the annual volumes delivered under the current contract have ranged from 1,420 in 2010/11 to 1,686 in 2007/08. The specialties of dental, endoscopy and general surgery tend to dominate. Figure 4 shows that these specialties comprised 80% of discharges across the two recently completed financial years of 2011/12 and 2012/13. Other specialties are: orthopaedics; gynaecology; ear, nose and throat; urology; ophthalmology; and plastics.

Figure 3: Mobile surgical discharges by financial year, 2006/06 – 2012/13



Source: Mobile Surgical Solutions Ltd; Sapere analysis

Figure 4: Mobile surgical discharges by health specialty, 2011/12 and 2012/13



Source: Mobile Surgical Solutions Ltd; Sapere analysis

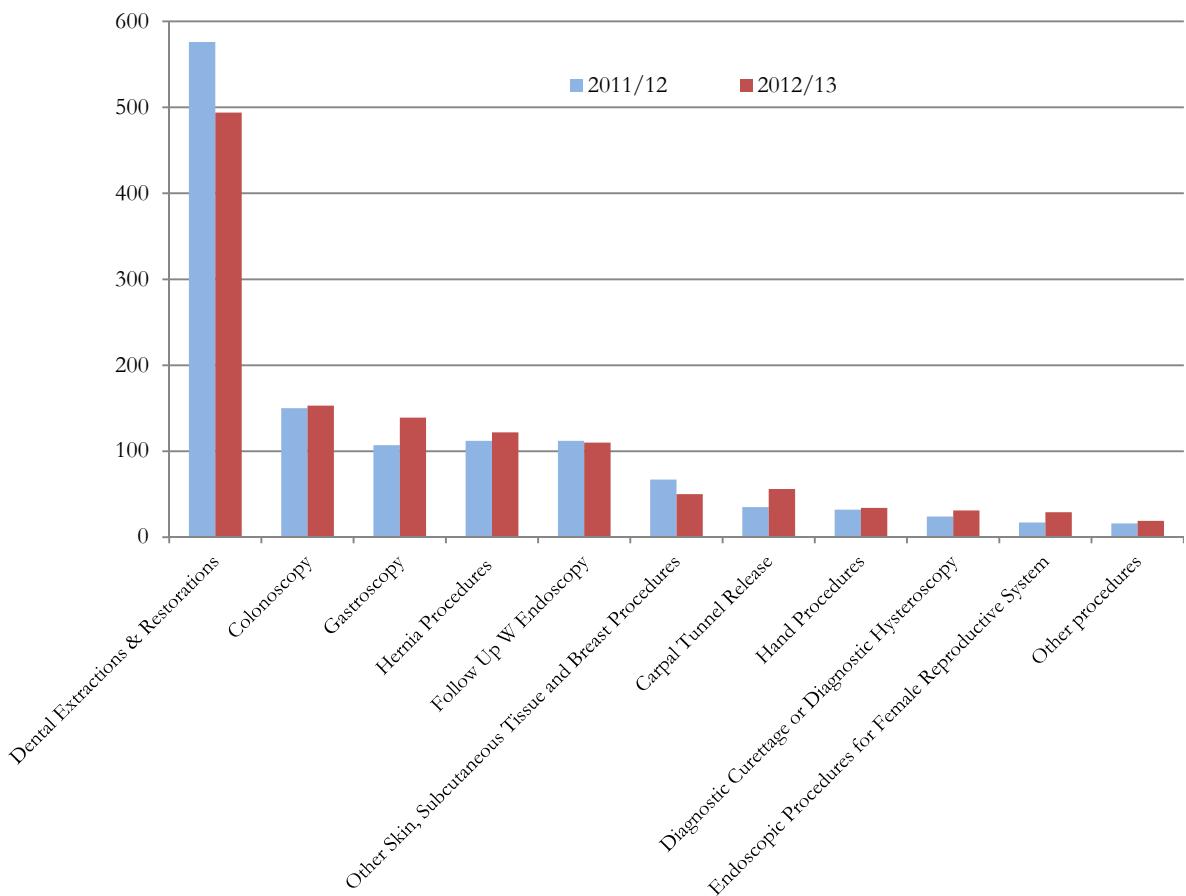
Dental extractions and restorations were the most commonly performed procedures during the recent full years of 2011/12 and 2012/13. Figure 5 shows that dental extractions and restoration procedures numbered around 580 and 490 discharges per annum in these years, or 33% of discharges delivered. We understand these procedures are largely for children and that, in some cases, can involve multiple extractions and fillings. One rural nurse who has been part of the mobile surgical service since its inception commented as follows.

We were sometimes pulling out 10 to 16 teeth in a single child when we first started. Now they're not waiting as long and we do health promotion messages in the post-op care unit. So the cases aren't as bad, but they're still bad.

Colonoscopies (150 discharges per year) and gastroscopies (100 and 140 discharges) were the next largest categories, accounting for 10% and 8% of volumes over this two-year period. Hernia procedures (110 and 120 discharges) also accounted for around 8% of all discharges across these years.

Figure 5: Mobile surgical discharges by top 10 DRG codes, 2011/12 and 2012/13

Number of procedures



Source: Mobile Surgical Solutions Ltd; Sapere analysis

4.1.2 Surgeon availability and patient safety determine the scope of services

The provider publishes a schedule of upcoming visits six months out. The schedule tends to follow the same pattern, while allowing for public holidays and training or demonstration days. Occasionally a one-off “blitz” day is held, at the request of a DHB to help manage demand at a certain site – recent examples include gastroscopies and colonoscopies. Overall, the health specialty areas covered by the mobile surgical service within each district depend on the availability of surgeons who are willing to work on the bus (and their views about what can safely be done on the bus). DHBs work within these limits, in terms of selecting the frequency of each specialty for their allocated surgical lists through the year. DHBs that we spoke with made these decisions by examining waiting lists and patient suitability for the rural host site.

We have some control of the mix of lists – it depends on patient need and availability of consultants. We use the doctors that are willing, typically general surgery and orthopaedics.

The mobile service has looked at the surgeons who're available. That determines the lists.

When asked about other needs, DHB service managers acknowledged that there are other health needs in rural communities, but that the constraints are the frequency of the bus visits and the suitability of some procedures and patients to be safely managed following surgery. Several stakeholders, clinical and managerial, pointed to the issue of patient safety as a judgement that ultimately sits with the operating surgeons at each rural site.

A lot of the waiting list backlog is more complex than what can be handled on the bus, for example, a lot of the orthopaedic surgery. The bus is like a day-stay facility without the back-up, so they'll always be limits to things that you can do in that environment.

They're unable to tonsils and adenoids for children – the surgeon won't do them, as it's the risk of post-op bleeding. The patients are supposed to be in five hours of post-op recovery, so that's the restraint. But the number waiting for [that] surgery is quite big.

One DHB service manager commented on the schedule and frequency of visits, and while acknowledging that this has been stable, queried how the route is determined overall.

There's a question about how they determine the frequency and number of days at a certain place. There doesn't seem to be any review and the bus just goes around in same pattern. You could question if x times per year is appropriate for one site versus another.

4.1.3 Hospital capacity does not appear to be reduced

None of the DHBs that we spoke with raised any concerns about the bus taking staff and reducing capacity in their provider arm. One DHB noted that MSS Ltd has consulted with them for their views on which surgeons may be suitable for the bus. Two of the DHBs stated that their surgeons either take leave or carve out time from their usual private practice.

Our consultants have a mix a public and private work anyway... most will build it into their private practice. They're substituting their private time, so it doesn't affect our capacity. I haven't had anybody decrease their public capacity to go on the bus...

Two general surgeons are keen to work on the bus... but generally not during operating or clinic time. If they do miss a session, then I ask another surgeon to come in and cover it. The surgeon who works on the bus has to take annual leave.

One DHB commented that the head of a department had allocated a day out of non-clinical time every five weeks to operate on the mobile bus. This was driven by desire to improve access for patients and appears accepted “*We know in advance and it’s part of his role here*”.

The provider has also stated that they aware of the issue of not taking away capacity from DHBs and generally try to work with elective service managers at DHBs. Staff contracted to work on the bus generally take annual leave or their private practice days.

The additional capacity provided by the bus appears to be appreciated by DHB service managers, and this may continue to be the case as the waiting time target reduces from five to four months. Two service managers commented that the surgical volumes, although small, are useful for helping to meet targets for waiting times and elective surgery case weights.

Those case-weighted discharges all help. It means I don’t have to push those patients through the base hospital theatre. A full day is our aim... the staff on the bus are being paid to work for 8 hours, so let’s get the most out of that capacity [by having a full list].

The bus is like an additional theatre. It’s a small percentage of our target case weights, but it would be harder to meet the targets without it.

A couple of DHB service managers noted that the shift in patient waiting time targets for elective surgery from a maximum of six to five months, and soon to four months, is “a massive change” and that they’re much more driven by the need to meet those targets. This might mean re-looking at the sites, time in the district, mix of specialties and how the patients are scheduled.

We recently said that we’re thinking about how the bus can better complement this new world of targets. We’d like them to look at what they do and they’ve said they would.

4.1.4 No major issues with referral pathways

The DHB service managers that we spoke with were satisfied with the referral pathways for patients being treated on the mobile surgical bus. In each case, the service manager was clear that their DHB operates a single waiting list and that patients treated on the bus are offered that option, once they pass the threshold for elective surgery.

They all qualify for the [district health board] threshold to get on the waiting list.

We only have a single list. If they don’t meet the DHB threshold for surgery, then they won’t be treated on the bus.

All patients must go on the DHB waiting list and they’re then chronologically assigned to lists. We’re closely monitoring elective waiting times, with the move to five-month targets.

One DHB acknowledged that, in the past, there had been direct referrals of patients onto the bus, form a rural hospital site operated by a community trust. This is now no longer the case, with all stakeholders agreeing that patients within the district should be managed by DHB booking staff under a centralised list. In another case, a community trust acknowledged that they had directly referred to the mobile surgical bus in the early days of the service, but that their DHB now requires all patients to be managed via a central list.

A couple of DHB service managers pointed to steps that had been taken within their district to assist patient access to the mobile service at rural sites. One DHB holds outpatient clinics with visiting specialists at the rural hospital site in question, which means that the referring consultant is, in some cases, the same surgeon that operates on the mobile surgical bus. This means that some patients are able to have their assessment and treatment closer to home, and some, cases, handled by the same consultant. Another DHB has approved a general practitioner with a special interest who sees a lot of the children in the rural area in question, including those that are referred to the waiting list and treated by the mobile surgical service.

We have a credentialed general practitioner to see them locally as an outpatient for their first appointment; that's where the referrals are generated from, if they're living in the area.

4.1.5 No evidence of large differences in waiting times

We asked DHB service managers about waiting times, and whether these were different for patients treated on the mobile surgical bus when compared with those treated at a base hospital. The general consensus among the service managers that we spoke with was that there was no significant difference in waiting times, or evidence that bus patients were systematically being treated more quickly than other patients waiting for equivalent surgery.

The head of department contacted me a few weeks ago, seeking a comparison of wait times for here and [rural hospital] – and there was no difference.

Whenever we select patients for lists, it's a combination of factors, such as health priorities and waiting times and also the location and age of patients. It's fair to say we have more who can be done on the bus than can be accommodated... They're all getting the same surgery but just in different settings and often with the same surgeon.

There may be cases where a patient receives surgery a couple of weeks earlier or later than would be the case if they were treated a base hospital. This difference depends, in part, on when the mobile surgical bus is next scheduled to arrive. When given the choice, it appears some patients or caregivers are willing to wait a little longer for elective surgery, if that means they can avoid a trip to the base hospital.

Sometimes it might make sense to allow a mum with two kids to wait a couple of weeks for the bus to come, instead of them travelling to the base hospital. Some people are willing to wait a bit longer... if they can have the surgery closer to home.

Parents are happy to wait for 4-5 weeks longer [than otherwise] because they'd rather wait for the service at [rural hospital] than get called into [base hospital].

4.1.6 Most rural sites are very happy to host the bus

Most general managers of rural hospital that we spoke with were supportive of hosting the mobile surgical service. There were several comments that the bus was seen as a replacement fulfilling loss of surgery in 1990s and helping the staff and town to feel like they were a “real hospital”. Most mentioned improved access to services in the community as being the key benefit, along with the experience gained by their nursing team.

We're supportive of the bus 110%, from a rural hospital point of view. The centralisation of surgery was a loss for us, so the bus has given us a sense of regaining surgery. The benefit is that a proportion of patients no longer need to travel and incur a cost.... And it's consistent with “Better, Sooner, More Convenient” – especially being “more convenient.”

Our operating theatre had been closed and the public asked us what else to replace it... MSS asked us at the right time. So there was strong public support for the bus – a lot of kaumātua and children were on board.

Our surgical operations closed in the 1990s... so our nurses lost the ability to work in surgery. So I saw the potential to get that back and to provide the service in the community.

We were keen to get access to the surgical bus and the telepresence, as we're surrounded by mountains here. There was a party the night the surgical service opened here.

The hosting costs borne by the rural host sites largely comprise nursing staff time, with sites tending to providing four nurses for the day. Other direct costs include administration coordination time, consumables, bed linen, electricity and the overheads associated with the use of admission and recovery spaces required to support the service flow. As well, there is a one-off capital outlay for a special plug for the electrical connection. These costs are borne directly by a DHB in cases where it owns the rural hospital. In some cases where the hospital is run by a community trust, a DHB may provide some funding to offset the costs.

The general manager of one rural hospital was less enthusiastic about hosting the bus. One factor was that the hosting is costly to the community trust-run facility. Another is that the service is “disruptive and puts pressure on rostering and nursing staff”. Furthermore, a lack of buy-in from surgeons in the district meant that the lists are becoming dominated by paediatric dental surgery, whereas there are other local health needs.

4.1.7 Rural nurses are trained up and see wider benefits

Several rural hospital managers noted that they had made a pool for 4-6 nurses available to work with the mobile surgical service for one day every five weeks. The roles are scrub nurse, circulation nurse, and two roles to handle pre-operative admission and then recovery in a post-anaesthesia care unit. We need continuity for the service and use same nurses;

The nurses mostly had on-the-job training, supplemented with training at the annual rural workforce conference held by MSS Ltd. The training counts towards maintaining a practicing certificate as a registered nurse.

They did a training day with us at the start, such as patient recovery and airway management... We've had refreshers – a non-surgical day – learning how to use the equipment, such as the defibrillator, and knowing where everything is for safety reasons.

I've never felt unsafe on the bus or in recovery with a child. The team that travels with the bus is very knowledgeable and they're happy to help if you're not quite sure.

Some nurses and managerial staff saw their training and experience on the bus as being useful and crossing over to their usual role within a rural hospital setting.

You learn about airway management, which is useful for dealing with unconscious patients. I've been able to relate it back to my work in the ward, for example, if someone has overdosed. You just focus on their airway and breathing, whereas others might be less sure of what to do... you learn not to get distracted by other things.

It's valuable for staff on the ward dealing with a resuscitation situation – and you could be exposed to that here. Anything you learn is potentially applicable.

There would be some crossover – some of the nurses who work in ED or on the ward, they should be able to more competently assist with the medical team.

All of the nurses that we spoke with commented that they enjoyed the experience of working on the mobile surgical bus. It was seen as a new challenge and “*something different*”.

I'm from aged care but I love it. I would do it every week if I could.

My colleagues are somewhat envious and see me as fortunate.

They're clamoring to be able to get that different experience – admitting, post-op care and standing next to surgeons and being involved.

In one case, a medical centre contributes a practice nurse to work on the bus, alongside the hospital-based rural nurses. The rationale was to build links, support the bus visits, and gain extra skills to fit with the minor surgical service offered by the medical centre. The centre covers the costs of backfilling the role for one day in the five week cycle between bus visits.

4.1.8 Evidence of some good relationships in place

It appears that MSS Ltd has had some success in building the necessary relationships. Most stakeholders that we encountered, among service managers and rural hospital management, all had positive comments, such as the provider being willing to listen and to meet needs. The following quotes are from service managers the three different DHBs.

The provider is flexible – they do try to meet our needs.

I have a good relationship with them. They visit 2-3 times per year and we review the dates and needs for them and us.

On one occasion when they had an engine issue and they called to stay they may not be able to make it in time. We said... just get it here to work on the list of waiting patients. And they did. It was possibly new for them to know that we're committed to getting the most out of their service. They recognised the need to meet its commitments and that if it couldn't come, that this would be a significant event for us. So they really went the extra mile.

Stakeholders from communities, including rural hospital staff and community leaders pointed to the provider's willingness to hold open days or to give presentations to help build awareness of the service in the community. One clinical nurse manger commented that this had helped to allay the fears of some families and whānau.

They're open to the community. If a community group wants a presentation, they're always happy to come along.

They held bus open days in 2013 and 2011. There was a presentation to a Rotary evening – to raise awareness... So there's a sense of ownership of the bus here...

In our discussion with the provider they pointed out a longstanding community education focus that includes occasional demonstrations at high schools. These days involve introducing kids to the bus – sending the signal “*you could do this*”.

4.2 Impacts and outcomes – patients value the service highly

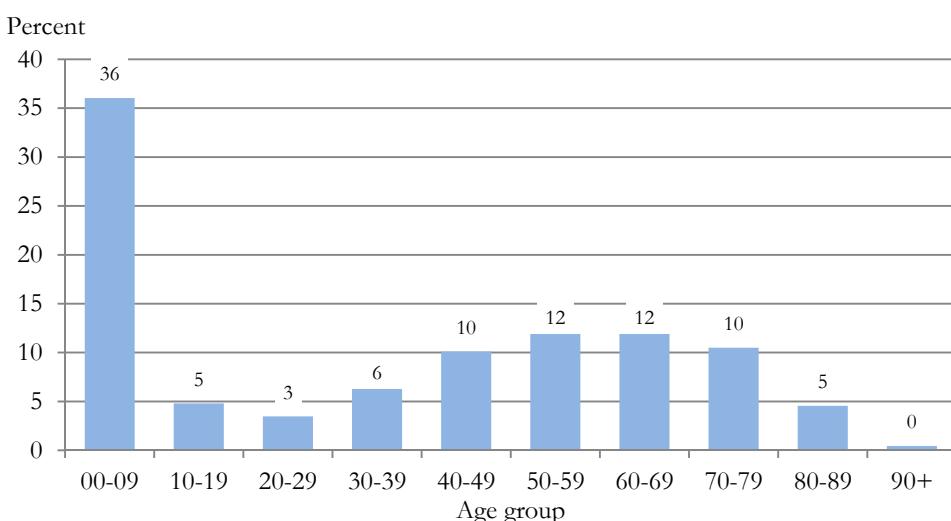
4.2.1 A focus on high-need populations in rural areas

Patients receiving treatment on the mobile surgical bus have tended to be children, young people, and older people aged 60 years and over. These are groups that typically have higher health needs. It should be noted that their levels of access are supported by the mix of services offered on the bus (e.g. dental, endoscopy). Figure 6 presents the discharges between 2006/06 and 2013 by aggregated by ten-year age groups. Children and young people under 20 years comprised 41% of discharges. Children aged 0-9 years comprised the largest ten-year age group (36%) and are predominantly receiving dental surgery. People aged 60 years and over accounted for a further 27% of discharges during the same period.

The service also appears to enable a relatively high proportion of Māori to access day surgery in rural areas. Patients who identified as Māori comprised 24% of discharges over the period of the current contract, from 2006/07 to 2013. In contrast, Māori comprised around 14-15% of the national population during this period, and 18% of the population in rural or semi-rural areas.⁴ The mobile surgical service can therefore be seen as contributing to improved access to health care for Māori, thereby helping to reduce health inequalities.

In contrast, Pacific peoples accounted for only 2% of discharges over the same period – lower than their share of the national population (7%). This difference is not surprising, given that 98% Pacific peoples reside in urban areas. By our calculation, approximately 1% of the population in rural or semi-rural areas belongs to a Pacific ethnic group.⁵ This suggests that Pacific peoples are not under-represented among rural patients accessing the bus.

Figure 6: Elective surgery day procedures, by age group, 2006/07 – 2013



Source: Mobile Surgical Solutions Ltd; Sapere analysis

⁴ Statistics New Zealand (2013) *2013 Census QuickStats About National Highlights*.

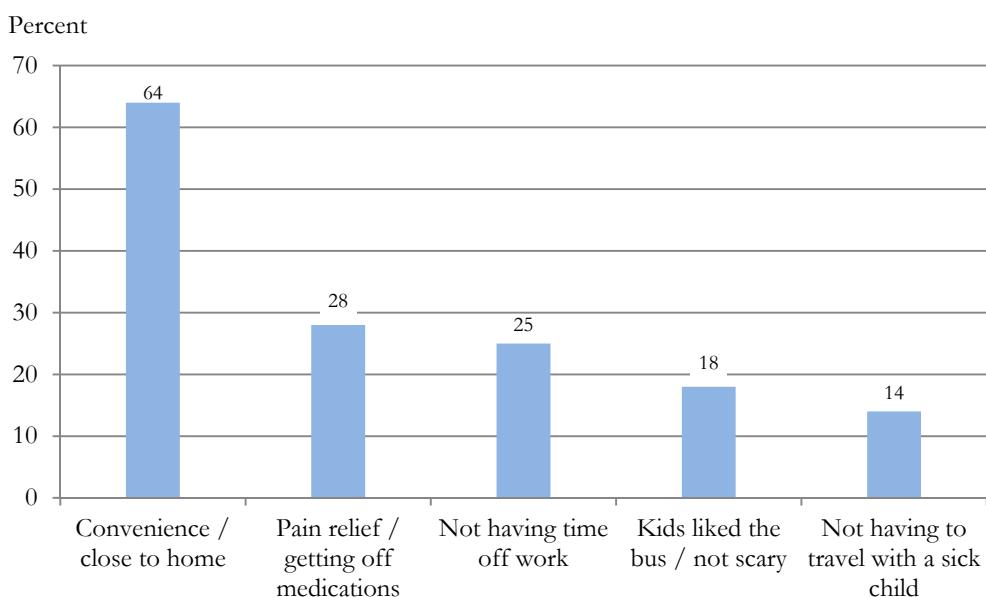
⁵ Statistics New Zealand (2006) data tables from *New Zealand: An Urban/Rural Profile Update*; <http://www.stats.govt.nz>; Sapere calculations

4.2.2 Patients value the service most for its convenience

When asked about what they most valued about the service, the majority of patient and caregivers cited the convenience of having the service available locally. Among the patient telephone interviews, 67%, or 18/28 interviewees mentioned that the service was convenient or close to home – as shown in Figure 7. Some of the more specific reasons cited were: pain relief/the opportunity to stop taking medication; not having to take time off work; the child liked the bus or found that it was not scary; and not having to travel with a sick child.

A similar theme was apparent among the patient postal survey, with 86%, or 36/42 respondents citing convenience or not having to travel.

Figure 7: Patient telephone interviews – what was valued most about the service



Source: Sapere Research Group

When asked what convenience that meant to people there were a range of responses.

I don't drive so would have had to have others take me.

Having it so close was magic, especially for us older people.

Not having to travel meant we saved two days and employment for two people for those days.

Getting her home straight away was so much better than having to drive for two hours. She was less distressed... and could just play with her own toys as normal.

A quote from a parent of a child who lived in Takaka illustrates how the term “convenience” can include multiple elements.

If we had to go over the hill to [the base hospital] we would've needed two of us go – which means a loss of income for her. Then we would have had to go the night before and stay the night after (to be near the hospital) so it would be two nights' accommodation, all the food, and petrol too. That is invaluable not to have to deal with that. Not to mention the stress of it all, especially for my child who finds things out of routine very stressful and difficult.

4.2.3 Staff on the bus were rated very highly by patients

We asked patients about their general perception of the staff in the bus and in recovery on the day of their surgery, although it was made clear that this not a review of staff. Among the telephone interviews, 100% of responses were positive and complimentary about the staff, their professionalism and their welcoming attitude. People used descriptive words such as “*Superb*”, “*Awesome*”, “*Really lovely*” and “*Marvelous*”. Many commented on the jovial nature of staff and how this relaxed them.

Many parents reported how fantastic the staff were with children. Examples include giving the children gifts (e.g. toothbrush and toothpaste), having a film playing beforehand to distract the child, having coloured anaesthetic face masks and making them feel at ease. Some parents talked about the language and how the staff pretended the bus is a space ship.

4.2.4 Patient feedback to the provider is highly positive

Feedback provided by patients directly to MSS Ltd is also highly positive about the mobile surgical service. Feedback forms are distributed on the day of surgery and returned on the same day, or soon after. The questions relate to the usefulness of the information provided before / after surgery, the effectiveness of DHB communication in preparation, individual needs being met, and the competence of the staff. Respondents are invited to rate their experience on a five-step scale ranging from “very poor” to “excellent”

Our analysis of a random sample of 150 forms found 95-99% of responses to each question were rated “good” or “excellent”. On average, across all questions, 75% of respondents gave “excellent” as an answer with 23% answering “good”, equating to 98% rating the service as either “excellent” or “good”. Patient and caregivers were also invited to comment on the service, and we provide a cross-section of these comments below in Table 5.

Table 5: Selected comments from a sample of patient feedback forms

“Positive” comments	“Negative” comments	Feedback for improvement
<i>Very good service. Left a good impression on our whānau</i>	<i>My bandages stuck to my wounds.</i>	<i>They could provide supplies – like dressings and a sling.</i>
<i>What a great experience.</i>	<i>The first couple of people on the list have to start clean prep before 6am!</i>	<i>The form said to report to reception but there was no sign and it was difficult to find.</i>
<i>They could teach a few other hospitals a few things.</i>	<i>I was unable to read the information they sent.</i>	<i>Better signage would be good.</i>
<i>We are very lucky to have such an excellent service.</i>	<i>The waiting time was too long – the appointment was at 10am but I didn’t go in until 2.30pm.</i>	<i>It would be nice to have little polar fleece blankets for the children.</i>
<i>Keep the bus coming.</i>	<i>The doctor should explain what he found.</i>	<i>Parents need more information on what to expect.</i>
<i>This is such a great asset to our rural community.</i>	<i>It was cold on the bus.</i>	<i>The nurses need a pay rise.</i>
<i>It is useful for families to be able to be part of the healing process.</i>		

Source: Mobile Surgical Solutions Ltd; Sapere analysis

A registered nurse from MSS calls patients at 30 days post-surgery to ascertain how things are going for them. If there are any issues, for example, around wound management or infection, advice is provided she provides advice what to do, links them in to a clinic with the surgeon or suggests they go and see their GP. As part of this process people often give feedback of their experience with the bus, even though that is not the purpose of the call.

The key things people feedback about are overwhelmingly positive, There are mostly positive comments, and are typically about the convenience of being able to have the surgery locally. This is especially important for parents of children and elderly people, who appreciate the reduction in travel time home following the administration of general anaesthesia.

Although negative comments tend to be few in number, they typically fall into two themes.

- Parents wanting faster access to their children post-surgery. That is, being able to be with them when they wake up.
- Waiting times on the day. Some people, due to other surgery taking longer than expected, have to wait longer than they perceive to be fair.

Regarding faster access to children, it should be noted, in fairness, that good practice for post-anaesthetic nursing care recognises there is level of risk involved and that care should ideally be one-on-one nursing.⁶ Furthermore, there are also standards that govern post-anaesthetic care, and in a hospital setting, a child would usually wake up without the parent.⁷

4.2.5 What people liked the least about the service

Patients and caregivers who completed the telephone interviews or postal survey were also invited to state what they liked least about the mobile surgical service. Among those who responded to the postal survey, 67% or 28/42 answered that there was nothing that they liked least about the service, or that they could not think of anything. There were no other common answers, other than three comments about physical access to the bus: “*a blustery and rainy day so a covered entrance to the bus would be an improvement*”; “*the bus was parked in the car park, so no car parks*”; and “*the walk from the medical centre to the bus*”.

Among the interviewees, 42%, or 12/28, had “nothing to say” or could not think of anything they liked the least. The most common issue was from seven caregivers, or 25% of the sample, who were concerned that their child woke from the anaesthetic on the bus without them there and became distressed.

If children wake up and don't know where they are, and can't see anyone they know, of course they're going to be scared.

As noted above, this concern about access to children post-anaesthesia is also a concern that the provider's nurse hears in some of her 30-day follow-up telephone conversations. It was also evident in some of the patient feedback forms. However, good practice in hospital settings means that the parent would not initially be present when their child woke up.

⁶ Lethbridge, L. RN, Bachelor of Nursing Honours. *A Literature Review: Nursing Assessment in a Post Anaesthetic Care Unit*. Belmont Hospital. Undated.

⁷ ACORN Stanm <http://www.acorn.org.au/standards>

4.2.6 Cultural needs – no issues were raised

Looking across the three sources of patient views, we found no suggestion that the mobile surgical service was not sufficiently addressing the cultural needs of patients.

- **Patient telephone interviews** – 79%, or 22/28 interviewees, stated that their cultural needs were met, including all who identified as Māori. No interviewees answered that their cultural needs were not met, while the remainder saw this issue as non-applicable.
- **Patient postal survey** – 62%, 24/39 respondents, said “yes” to the question about whether their cultural needs were met. No respondents answered “no”, while the remaining respondents answered that this question was “not applicable”.
- **Sample of patient feedback forms** – 98%, or 147/150 feedback forms sampled included ratings that were “good” or “excellent” to the question “How well do you feel that your individual needs were met?” This question not only covered cultural needs, but also needs related to a disability or other special needs.

These findings are consistent with the interview comments from the clinical manager of a hauroa provider, whose Tamariki Ora clients use the mobile surgical unit for dental as well as ear, nose and throat surgery.

There's nothing more (or less) culturally attractive about the bus that I know of. It's more about ease of access. I haven't seen any apprehension or cultural negativity... What I like is that it provides us with an alternative to [base hospital] and this reduces whānau stress.

4.2.7 Travel times to reach the bus tend to be short

The majority of patients sampled for this review travelled less than 20 minutes each way to have their surgery on the mobile surgical bus. Among those interviewed by telephone, 79% or 22/28 reported travel time of less than 20 minutes each way. The comparable figure for the patient postal survey was 65%. These findings are consistent with the comments made by patients and caregivers about the convenience of the service, and specifically, not having to drive further to a base hospital.

Some patients experienced a longer travel time to meet the bus. The longest driving time among those interviewed was reported as being 40 minutes each way. Respondents in the postal survey reported some longer travel times, with 9%, or 4/43, reporting travel times of more than 60 minutes, with two respondents reporting two hours or more to reach the bus.

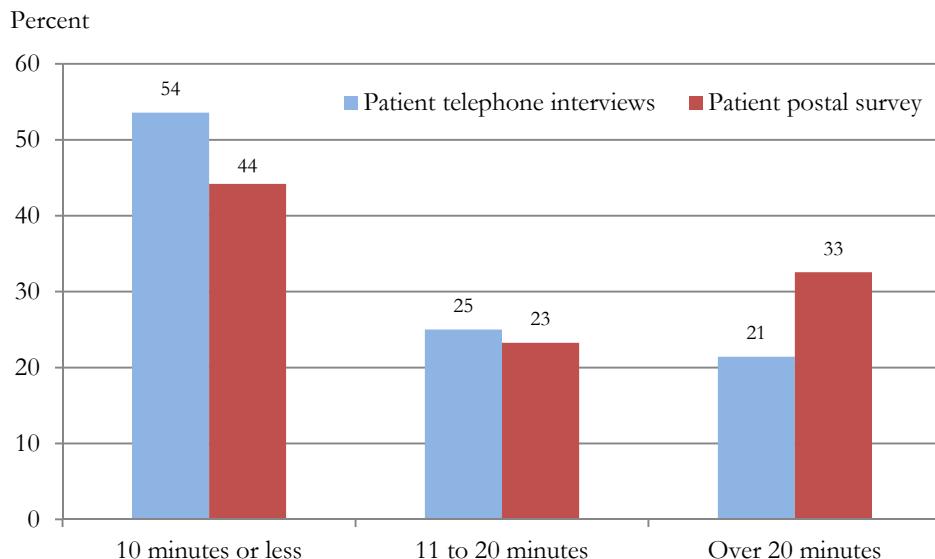
Consistent with the above finding, some of the stakeholders interviewed also noted that, in some cases, patients have to travel some distance just to reach the rural site hosting the bus.

From Waipoua Forest to here is already a one-hour drive just for surgery – one way. So it'd be an hour and 45 minutes for a trip to Whangarei Hospital.

For example, inland from Oamaru – places like Omarama – it's some distance, even to get to Oamaru; so the service is especially good for young families and older people.

Quite a few patients live south of Pukekōe, for example, at Tuakau and Waiuku. Those are the patients we try to select for the bus sessions at Pukekōe.

Figure 8: Patient travel time to reach the bus – self-reported



Source: Sapere Research Group

4.2.8 A slight improvement in the rate of non-attendance

The rate of patients who do not attend their appointment for the mobile surgical bus has been fairly stable at 4.1-5.0% between 2006/07 to 2012/13, as shown in Figure 9. On a rolling three-year average basis, there has been a small decrease from an average of 4.8% in the three years to 2008/09 to an average of 4.4% in the three years to 2012/13. This rate is calculated by taking all those patients who did not attend their appointment for surgery on the bus as a proportion of all surgery delivered plus those who did not attend.

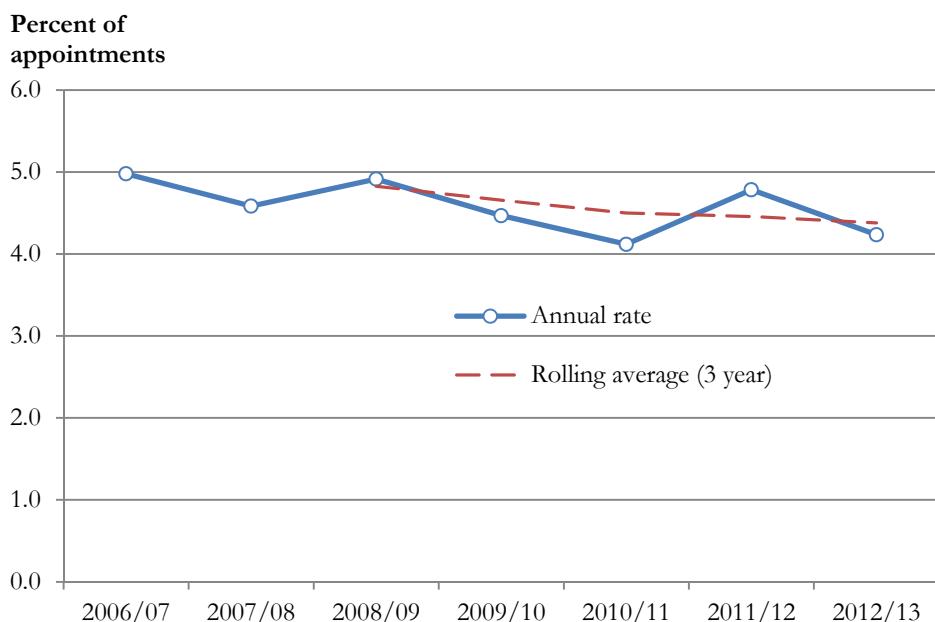
There is no centrally-held information to enable a direct comparison with base hospitals to determine how these rates compare with similar surgical procedures. The only publicly available information on “did not attend” rates among district health boards relates to specialist clinical appointments (i.e. outpatient clinics) rather than appointments for day surgery.⁸ These figures are not comparable, given that anecdotally, far fewer patients tend to be recorded as “did not attend” for theatre than for outpatient clinics.

Nevertheless, it is plausible that the mobile surgical service has supported improved access for patients who may not otherwise attend, given that the service is relatively nearby for most patients. As noted above, the majority of sampled patients reporting travel time of less than 20 minutes. This view was supported by one DHB service manager who commented that...

Everyone has attended at [rural hospital] for the last few lists. The bus probably does have a lower rate of “DNAs” than at [base hospital].

⁸ Ministry of Health (2010) *DHB Hospital Benchmark Information. Report for the Quarter January - March 2010*. Wellington: Ministry of Health. The rates reported among district health boards were typically 8.5-9.5% during the period 2007-10.

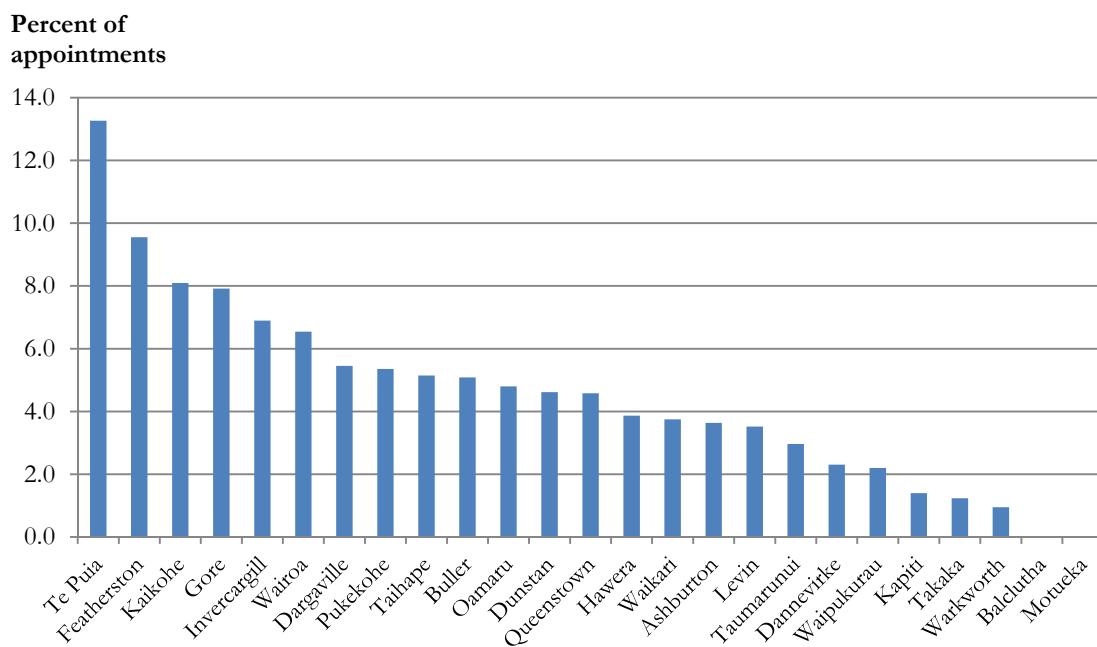
Figure 9: Rate of patient non-attendance, 2006/07-2012/13



Source: Mobile Surgical Solutions Ltd; Sapere analysis

Rates of patient non-attendance vary considerably across the rural sites. Figure 10 presents rates for each site that combine volumes for the two years of 2011/12 and 2012/13. Higher rates are apparent at Te Puia (13.3%) and Featherston (9.6%), whereas two host sites had no patient non-attendance over this period (Balclutha and Motueka). Anecdotally, some of these “no shows” are replaced on the day of surgery by calling up patients placed on stand-by.

Figure 10: Combined rate of patient non-attendance for 2011/12 and 2012/13, by site



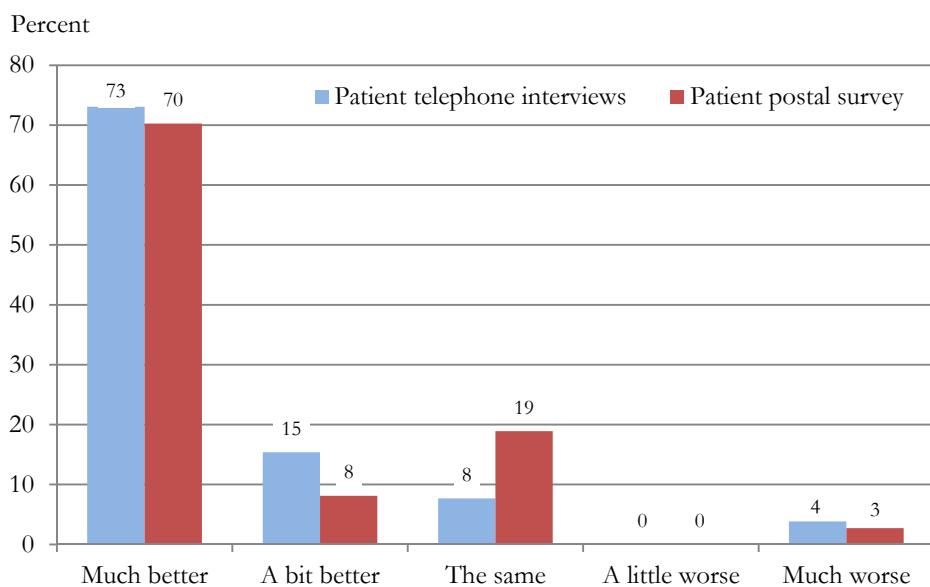
Source: Mobile Surgical Solutions Ltd; Sapere analysis

4.2.9 Patients reported improved well-being after surgery

Patients, or their caregivers, generally reported improvements in well-being after surgery. Of those interviewed by telephone, 88%, or 23/26, answered that their well-being, or that of their child, was either “much better” or “a bit better” following their operation. The postal survey produced a similar result, with 78%, or 29/37 respondents reporting that their well-being, or in the case of caregivers, the well-being of their child, was either “much better” or “a bit better”. The full distribution of self-reported outcomes is shown in Figure 11.

Patients (and caregivers) typically provided reasons why they reported their (or their child’s) well-being as being “the same”. One patient, for example, stated that he felt he had not been “sick” in the first place (i.e. the surgery was for removal of skin lesions), while several others had undergone investigative procedures (i.e. endoscopies) rather than remedial surgery. The one person who said they were much worse was that the surgery didn’t find anything and so they are under the specialist still. One male said he was much worse, however he wasn’t sure if it was due to the surgery or not.

Figure 11: Post-operative well-being reported by patients and caregivers



Source: Sapere Research Group

Specific post-surgery outcomes were also cited by patients and caregivers during interviews.

- Several patients commented that they were able to stop taking painkiller medication after their surgery. Several caregivers mentioned this with respect to their child who had been a patient. The painkillers mentioned were codeine, Panadol and ibuprofen.
- One woman mentioned that she had visited an emergency department ten times in a year for morphine pain management, but now, following her operation on the mobile surgical bus, only uses Panadol “*every now and then*”.
- A couple of patients also mentioned they had taken several courses of antibiotics while getting referred to, and while being on, the waiting list for the mobile surgical bus.

4.3 Considering the counterfactual – what if there were no bus?

To understand the impacts of the mobile surgical service, it is useful to consider the counterfactual – what would happen in the absence of the service. The three district health boards that we spoke with stated that, in the absence of the mobile surgical bus, patients who would have been treated on the bus would still qualify for surgery, but they would have to travel further. The likely alternative was seen as day surgery being delivered from a DHB's base hospital. The following quotes are from service manager at two district health boards.

*The patients would still qualify – we only do patients on the bus that qualify for surgery...
The patients would all have to drive to [base hospital]... They'd come for an outpatient appointment and then drive back again for the surgical procedure.*

The patients would be managed on elective waiting lists and would still be offered surgery in chronological order. They would likely have to travel a bit further from home.

Comments from service managers at two district health boards suggest that provider arms may be able to absorb the volumes from the mobile surgical bus, although in fairness, these comments were made “off the cuff” without any detailed analysis. However, some of the potential trade-offs were noted, such as waiting times for elective patients in other specialties being extended, or surgical lists being extended or added. A further consideration is that most district health boards have one or two hosting sites, which in the absence of the bus, would require capacity to meet 10-20 all-day surgical lists per year, or 1-1½ lists per month. Southern DHB, with five sites, might face 50 all-day surgical lists per year or one each week.

We'd probably have capacity to absorb it... it might mean some of the shorter waiting times for other patient are extended a bit... but we could still absorb it because it's usually 8-10 patients every trip, which are 5 weeks apart.

Our response would possibly involve doing the volumes in-house with extra sessions or longer days. Or we might outsource some of it elsewhere. It's a small percentage of our target case weights, but without the bus, it'd be harder to meet the targets.

Stakeholders based at rural sites that host the bus tended to agree that the alternative would be for patients to travel to a base hospital for their day surgery. These local stakeholders also tended to comment on what that additional travel might mean for patients and their families. The following quotes from general managers at four rural hospitals point to some patients – typically children or older people – being less likely to travel or having to wait longer.

There would be more kids not getting the surgery they need... Sometimes paediatric dental problems reflect how much effort is put into their health and care overall. So the easier it is to access services, the more likely they are to attend.

Many parents who've had kids on... say they'd never have gone through it without the bus.

If there were no service, the patients would have to travel to [base hospital]. It could be a barrier for some, such as the elderly population. I wouldn't say generally, but it's plausible that some people would find it a barrier to travel.

The kids would have to wait for capacity at [base hospital] as it has limited theatre sessions allocated to dental surgery. The wait list is longer for paediatric dental there.

Two nurses who work on the bus at two different rural sites commented on the transport barriers facing some of the families with a child needing day surgery.

If there was no bus service a lot of kids would fall through the gaps, definitely. A lot of people haven't got the money or transport to get to [base hospital]. My opinion is based on what I've seen – such as families with no car or no money for petrol, or where mum is working, or even where there is no reliable caregiver.

They'd have to travel – but it's no fun getting over those winding roads with a post-anaesthetic kid. Those that need the service most probably wouldn't end up going.

The clinical manager of a hauora provider and general practitioner at a rural medical centre also noted that, in their view, some families may struggle to get their child to a base hospital.

Otherwise we'd have to send the kids to [base hospital] – half wouldn't go because the parents couldn't get them there.

There's high need for paediatric dental but [the surgery] wouldn't get done if it's not here. Some families wouldn't be able to sort the transport.

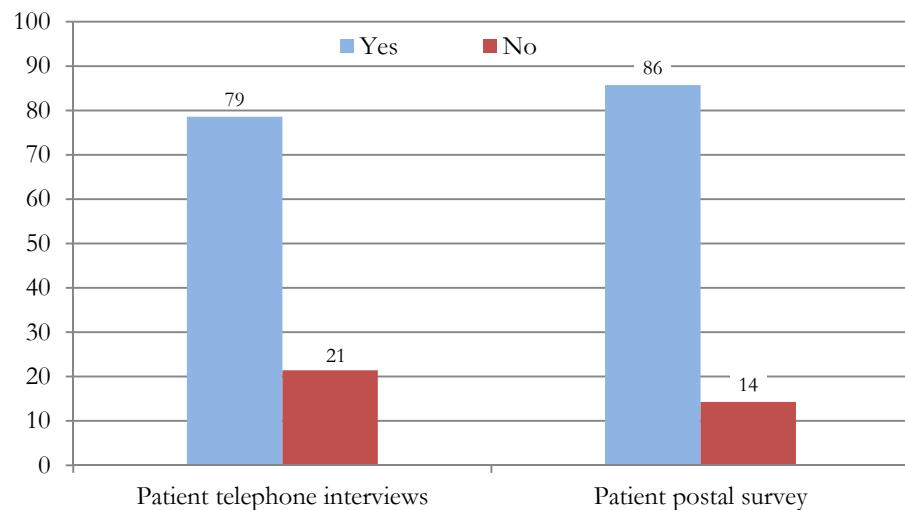
4.3.1 Most patients would travel further for their surgery

To test perceptions of transport barriers, we asked patients and caregivers whether they would have travelled to the nearest base hospital, if they had been unable to have surgery on the surgical bus. The finding from the telephone interviews and postal survey were that most patients (79-86%) would have travelled further if the mobile service had not been available.

- **Patient telephone interviews** – 79%, or 22/28 interviewees said that they would have agreed to travel further for the surgery if they had not been able to have the service on the surgical bus. The remaining 21% stated that they would not have travelled further.
- **Patient postal survey** – 86% or 37/42 respondents answered that they would have agreed to travel further for the surgery. The remaining 14% stated that they would not.

Figure 12: Whether patients would have travelled further for the service

Percent



Source: Sapere Research Group

The following quotes from caregivers reflect many of the statements made by those who stated that they would have travelled further in the absence of the mobile surgical bus.

Before the surgery she was on so many pain medications, including some that are addictive. She is a preschooler. I knew I had to get her off those medications as soon as possible. So yes, I would've had to travel further.

Yes, as he was in so much pain, he'd stopped eating. Now he's enjoying kai again.

It should be noted that the question of whether people would travel further was posed post-surgery, when most patients had an excellent experience and health improvement. It is therefore possible that these figures are positively influenced by the fact that these patients and their caregivers are in a better position to weigh up the costs and benefits of accessing a surgical treatment.

4.3.2 Up to 300 patients per year may not otherwise access surgery

Focusing on those who would not have travelled further for their surgery, the results from the telephone interviews and postal survey suggest the plausible range is 14-21% of patients. **This range equates to 210-320 patients from among the approximately 1,500 patients, who, on average, receive day surgery on the mobile surgical bus each year.** These are patients who have been assessed as meeting the threshold for elective surgery by their district health board. Therefore, in the absence of the mobile service, it seems reasonable to conclude that up to 300 patients per year would not receive the surgery required to address their health needs, if their alternative was to travel to a base hospital.

Respondents who stated that they would not have travelled further for their surgery cited a range of reasons or barriers, including:

- no access to transport;
- too costly to pay for transport, food and accommodation;
- having to take time off work, or others having to do so;
- having to take two adults;
- not wanting to travel back with a sick child or elderly person in the car, with potential after-effects of the anaesthetic, such as nausea and vomiting; and
- logistical issues of child care and the timing of school hours for other children.

There was no clear correlation between characteristics of those who would not travel to receive surgery if the mobile surgical bus was not available – for example by income, age or ethnicity. This may be due to the relatively small sample sizes.

4.3.3 Characteristics of patients who stated they would not travel further for surgery

The characteristics of patients who stated they would not travel further for their surgery were examined for any common elements. Summary information on these patients is set out in Table 6. This information must be interpreted with caution, given than the absolute numbers

involved are relatively small and form a minority of responses from the sample surveys. However, we would note the patients who stated that they would not travel further have the following characteristics:

- the patients were distributed across the age groups of 0-10, 21-64, and 65 years & over;
- most patients tended to identify their ethnicity as European or Māori;
- the majority of respondents (3/4 for the telephone interviews and 3/6 for the written survey) lived in households with an annual income of \$60,000 or less;
- dental was the most common type of surgery that these patients underwent;
- the patients lived in a range of district health boards, with being MidCentral (3), Tairawhiti (2) and Southern (2) each having more than one response.

Table 6: Characteristics of patients who stated they would not travel further

Patient characteristic	Patient telephone interviews	Patient written survey
Number of responses	6/28 (21%)	6/43 (14%)
Age group	0-10 years: 4 people 11-20 years: none 21-64 years: 1 person 65 years & over: 1 person	0-10 years: 1 person 11-20 years: none 21-64 years: 3 people 65 years & over: 2 people
Ethnicity	European: 3 people Māori: 2 people Pacific: none Asian: 1 person	European: 4 people Māori: 2 people Pacific: none Asian: none
Household income	\$0 - \$40,000: 1 people \$41,000 - \$60,000: 2 person \$61,000 - \$100,000: 1 person \$150,000 plus: none	\$0 - \$40,000: 2 people \$41,000 - \$60,000: 1 person \$61,000 - \$100,000: 2 people \$150,000 plus: 1 person
Type of operation	Dental: 4 people Gynaecology: 1 person ENT: 1 person	Dental: 4 people Endoscopy: 1 person General Surgery: 1 person
Location where patient lives	Dargaville (Northland) Drury (Counties Manukau) Opotiki (Bay of Plenty) Levin (MidCentral) Shannon (MidCentral) Newlands (Capital & Coast)	Ruatoria (Tairawhiti) Tokomaru Bay (Tairawhiti) Te Kuiti (Waikato) Levin (MidCentral) Wanaka (Southern) Cromwell (Southern)

Source: Sapere Research Group

5. Mobile surgery – cost-effectiveness

This section considers the costs of the mobile surgical service provided by MSS Ltd and whether it is cost-effective, relative to the plausible counterfactual of service provision by base hospitals. A full cost-effectiveness comparison has not been possible due a lack of detailed financial data. Instead, we examine a range of perspectives to build up a picture.

5.1.1 The original contract was based on a business case

We understand that the original contract negotiated between the Ministry and MSS Ltd in 2000/01 was supported by detailed costings.⁹ The contract was predicated on the understanding that the key elements – the volume of procedures, the effective price of such procedures and total costs – reasonably matched the *actual* costs incurred (including all overheads and depreciation) of delivering the services to the standard required.¹⁰ Some considerations underpinned this judgement, as follows.

- There are various components for which costs were assessed as being similar for MSS Ltd and DHBs, for example, staff time, consumables, equipment, and depreciation.
- Some costs were specific to MSS Ltd, for example, operating costs such as fuel, maintenance for the surgical bus, staff travel, as well as the service start-up costs.
- Threshold effects and minimum efficient scale issues were applicable to MSS Ltd (i.e. the economies of scale and scope achievable at DHB base hospitals could not be exploited to the same extent with a mobile surgical unit).
- Acknowledgement of a rural factor (i.e. distances and remoteness) leading to extra transaction and coordination costs.
- The overriding concern for the Ministry appears to have been to maximise outputs for a given level of funding, rather than finding the optimal unit prices for each component (i.e. the mobile surgical service versus rural professional development services).

The result was a “negotiated” price which aimed to reflect the costs of providing the mobile surgical service, but with some judgements about the extra costs and diseconomies of small scale face by MSS Ltd, relative to a base hospital. So from the outset, there was an acknowledged gap between the effective price per procedure paid to MSS Ltd and the equivalent national price set for DHB provider arms.

5.1.2 The current arrangements and a fluctuating “gap” between the contract price and national price

The Ministry of Health and MSS Ltd re-contracted in 2006/07 – initially for five years – and this agreement has been extended and essentially remains in place. The underlying basis for the contracted surgical volumes was changed from 1,500 procedures to 705 case-weighted

⁹ We have not examined nor sighted the business case

¹⁰ Telephone communication with previous contract manager at the Ministry of Health

discharges (CWD) per annum, although this desired number of procedures was still referenced.¹¹ The effective case weight price was derived by dividing the value of this part of the contract (which was unchanged at \$3.5 million per annum) by the volume of CWD. The contract notes the agreed volumes were an estimate of maximum throughput.¹²

Table 7 shows the “gap” in pricing between the effective CWD price received by MSS Ltd and the national CWD price over time. The price “premium” received by MSS in 2006/07 was around 58% above the national price. This premium was eroded over the following years because the national price was adjusted on an annual basis, whereas there was no adjustment to the contract price for inflation or cost pressures.¹³ As a result, in 2010/11, the price premium had been reduced to 13% over the national price.

However, a contract variation adjusted the effective case weight price from 1 October 2011, restored some of the previous relativity between the national CWD price and the effective price received by MSS Ltd. This was achieved by reallocating funds (\$0.5 million) from the other two components. In 2012/13 the premium was around 33% above the national price.

Table 7: Contract prices and case-weighted discharge prices – a comparison

Year	MSS Ltd – effective price specified in contract ¹	National price used by DHBs	Difference (premium over the national price)
2006/07	\$4,964.54	\$3,151.01	\$1,813.53 (58%)
2007/08	\$4,964.54	\$3,740.38	\$1,224.16 (33%)
2008/09	\$4,964.54	\$3,985.32	\$979.22 (25%)
2009/10	\$4,964.54	\$4,315.48	\$649.06 (15%)
2010/11	\$4,964.54	\$4,410.38	\$554.16 (13%)
2011/12	\$5,496.46 ²	\$4,567.49	\$928.97 (20%)
2012/13	\$6,153.85	\$4,614.36	\$1,539.49 (33%)

1. The effective CWD price specified in the contract with MSS Ltd varies due to the changes in the volumes contracted for and increases total amount set aside for this service within the overall contract.
2. This figure is a weighted average of the effective price prevailing for the first quarter of FY2011/12 and the new effective price for the remaining three-quarters of the year.

Source: Ministry of Health (2011) *New Zealand Casemix Framework for Publicly Funded Hospitals including WIESNZ12 Methodology and Casemix Purchase Unit Allocation*.

¹¹ The desired 1,500 procedures was equivalent to 705 case-weight discharges per annum, using an average day surgery case weight of 0.47.

¹² Clause 10.1.1 of the Service Specification

¹³ Clause 10.1.2 (g) of the Service Specification states that the price for each case-weight includes provision for all general cost growth over the term of the agreement, without indicating any specifics.

Given the implicit motivation to maintain the relativity between the respective prices, one possible expression of cost effectiveness is to look at the overall movements in prices across the period of the contract. Using the figures in Table 7 above, we see that the national CWD price has risen by 46% between 2006/07 and 2012/03, while the comparable increase in the effective CWD price in the contract with MSS Ltd has been lower, at 24%. To the extent that the ability to manage and contain costs is a measure of cost effectiveness, then these movements may be interpreted as demonstrating a degree of relative cost effectiveness on the part of MSS Ltd.¹⁴

5.1.3 Factoring in rural hosting costs increases the gap

The preceding examination of relative prices assumes that all the costs of the service are contained within such prices and, therefore, within the contract. However, a previous review of the mobile surgical service found that there were additional costs faced in hosting the bus, estimated at between \$600 and \$1,200 per visit.¹⁵ We understand that most of this amount relates to the nursing time contributed by the rural site – typically up to four nurses per day. Using data from the Nursing MECA and data on the number of surgical days completed in 2012/13, we were able to verify that the upper end of this range seems more plausible.

These hosting costs are not factored into the contract, but arguably, the effective price of a CWD for MSS Ltd should take these costs into account. In short, the mobile service essentially receives a higher CWD price than a base hospital for the same procedure, while also calling on DHB resources to assist in hosting the procedures undertaken (whereas hospitals absorb such costs within their CWD price).

We examine the impact of factoring these hosting costs into the CWD price in the 2012/13 year. Using a midpoint estimate of \$900 in hosting costs per day, 193 days of surgery in the year, and the contracted volume of 650 CWD, implies an additional \$267 on the price. This would mean an effective CWD price in 2012/13 for the mobile surgical service of \$6,420.85, or a premium of \$1,806.49 (39%) relative to the national CWD price.

5.1.4 Delivery of volumes above contract reduces the gap

Examination of performance against the contract is at least as important as the terms of the contract itself. The provider has broadly met or exceeded the contracted volumes, as measured by case-weighted discharges, for nearly every year since 2006/07. Across the terms of this contract, on average, MSS Ltd has “over-delivered” by 6% more CWDs annually than contracted for.

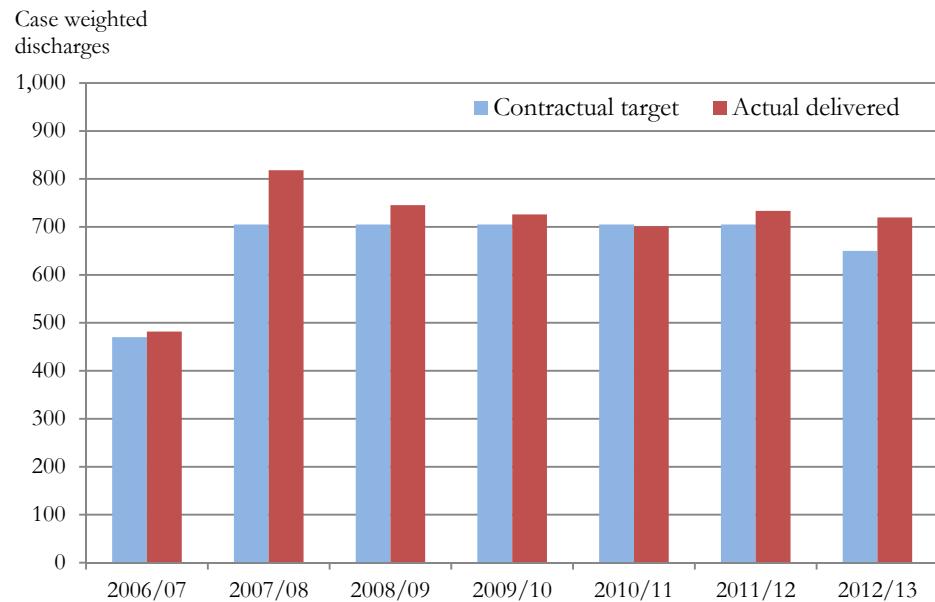
In the most recent full year, MSS Ltd over-delivered by around 11%, that is, 720 CWDs delivered versus 650 in contracted volume. Dividing the contract price by this higher volume would reduce the pricing “gap” in the contract to \$944.28 (20%). The inclusion of site hosting costs would mean the gap is \$1,185.46 (26%).

¹⁴ Such an observation is of course, predicated on the “gap” at the start of the contract being “right” (i.e. is cost reflective). As mentioned, it was not possible for us to verify this.

¹⁵ Based on an average of 10 visits to each site per annum. Central Region’s TASs (2006) *Review of the Mobile Surgical Service*. Prepared for the Ministry of Health p.40

From a health system perspective, if greater than contracted-for volumes are delivered, then the value received from the contract could be understated. With the exception of the 2010/11 year, MSS Ltd has delivered more CWDs than contracted for. The variance of -0.6% in 2010/11 (4 case-weights) is small enough to be within the margin of error.

Figure 13: Elective day surgery – performance against contract



Source: Service contract and MSS Ltd reported volumes

Note: Case weighted volumes are not directly comparable across years due to re-weighting. The target of 1,500 procedures was revised in 2012/13, from being 705 case weights down to 650 case weights.

Possible explanations for observed over delivery

The fact that MSS Ltd is able to deliver, on average, 6% more surgical volumes than set out in the contract could relate to the efficiency of its operations. It is plausible that MSS Ltd has obtained efficiencies over time. Alternatively, it may be due to the original contract being reliant on an initial estimate of maximum throughput and being cost-reflective. A further explanation could be that MSS Ltd is able to deliver such volumes via cross-subsidisation from the other components of the overall contract. There is some evidence in support of this view, given prior experience of significant over-delivery of the professional development and remote collaboration elements of the contract. Indeed, a previous contract variation recognised this possibility by increasing the funding tagged to surgery via a transfer from the other service components. We have not been able to ascertain the veracity of this view.

5.1.5 Considering avoided public subsidies for travel costs

A further element to consider is the avoided cost of travel and accommodation subsidies for people who would otherwise have to travel to receive care. The review conducted in 2006 cited a figure of \$63,800 in potential travel reimbursements under the national policy. This figure was derived from a sample survey that found 45% of patients would have had to travel

more than 100 km, if required to go to a base hospital for treatment.¹⁶ After adjusting for inflation, this figure equates to \$73,400 in 2013 terms. These avoided costs would be sufficient to purchase an additional 13 CWD, using the effective price of \$5,799.82 (which includes adjustments for hosting costs and over delivery). Factoring in the notional CWD value of these avoided costs would further reduce the effective contract price per CWD to \$5462.55, with the “gap” with the national CWD price being reduced to \$848.19, or 18%.

Table 8 summarises the results of the series of adjustments that we have considered. The final column of the table shows how the price gap with the national price is affected by:

- added in the hosting costs incurred by rural sites;
- factoring in the delivery surgical CWD above the volumes contracted for; and
- considering the avoided costs under the national policy for subsidising patient travel.

After factoring in the cumulative effective of these adjustments, our conclusion is that the effective price gap is more like 18% – this represents the premium that is being paid for the mobile service on a CWD basis.

Table 8: Tests on the CWD price “gap” – summary of results

Tests on the price “gap”	MSS Ltd – effective CWD price in 2012/13	National CWD price used by DHBs in 2012/13	Difference or “gap”
Base case – contract price in 2012/13	\$6,153.85	\$4,614.36	\$1,539.49 (33%)
Add in rural site hosting costs	\$6,420.85	\$4,614.36	\$1,806.49 (39%)
Over-delivery against contract in 2012/13 – also factors in rural hosting costs	\$5,799.82	\$4,614.36	\$1,185.46 (26%)
Avoided travel and work-related costs to DHBs – also factors in rural hosting costs	\$5,462.55	\$4,614.36	\$848.19 (18%)

Source: Sapere Research Group

¹⁶ Central Region’s Technical Advisory Services (2006) *Review of the Mobile Surgical Service*. May 2006

5.1.6 Other perspectives on cost and efficiency

The focus of this section has been on comparing the effective price of a CWD delivered by MSS Ltd with the national price of a CWD, under the assumption that the national price represents average base hospital costs. In the absence of detailed data on actual resource usage, this seems the most obvious comparison. However, we also consider other perspectives.

The potential for a new entrant

In competition analysis, especially for regulated industries, the Hypothetical New Entrant (HNE) test is often used to determine the efficiency of incumbents. The intent is to establish whether the incumbent's prices would exceed the costs of the HNE. As the name suggests, this is largely a theoretical exercise, and it is the threat of entry that is likely to constrain prices for the incumbent, rather than actual entry itself. Therefore, the potential for entry is an important consideration for assessing incumbent costs and prices.

In our view, the barriers to entry appear for the services provided by MSS Ltd are debatable – without knowing the capital requirements. If the barriers were low, this could provide a modicum of pressure on prices, although we acknowledge that it is debatable whether a competitive market exists. Indeed, we understand that the prospect of going to tender for the letting of the contract has not been ruled out.

The question of whether the threat of entry is sufficient to constrain pricing practices of the incumbent is complex and it is not possible to examine all the relevant factors in detail here. However, we do make the following observations.

- The range and depth of sector relationships held by MSS Ltd appear to matter and it may be difficult and time consuming for a potential new entrant to establish these.
- The potential new entrant may have advantages in respect of up-to-date technology (i.e. they have not sunk capital into older technology), which might result in lower cost.
- Discovery costs in terms of route optimisation and visitation frequency should be lower given the experience of the incumbent (a benefit for an entrant and the incumbent).
- The length of the contract matters for both the incumbent and potential new entrant, although it is likely to be felt more keenly by the potential new entrant, given the capital costs associated with investing in a bus, in particular.
- Given the public availability of the contracting arrangements between MSS Ltd and the Ministry a potential new entrant would have been able to assess (and reveal by way of approaches to the Ministry) their costs against the existing prices.¹⁷

Financial comparisons

As part of the agreement, MSS Ltd supplies the Ministry with a special purpose statement of expenditure of funds provided, prepared by Deloitte. We have seen the statement for the 2012/13 year. The level of detail in the statement was not sufficient for us to determine expenditure on each of the three contract components.¹⁸ On the strength of the statement we

¹⁷ We understand, anecdotally, that no approaches have been made to date.

¹⁸ MSS Ltd informed us that they do not separately cost the three components of the contract.

make the observations below. For the most part, these observations illustrate the nature of a commercial undertaking and the impact of scale on cost structures, rather than any definitive conclusions about service cost effectiveness.

- Expenditure on governance is around 2% of total expenditure, which seems higher than for comparable Board-related costs of some sampled DHBs with large rural areas, but does not appear to be excessive.¹⁹
- Labour costs (both salaried and outsourced staff), consumables and surgical communications account for around 59% of expenditure, while labour costs only for sampled DHBs are around 45% of total expenditure.
- Combined costs for the finance, insurance and office/general line items are around 7% of total expenditure, whereas the equivalent for the DHB accounts that we examined is around 1% of total expenditure.
- We were advised by the provider that the pre-tax return on the cost value of the asset base employed in the business for 2012/13 was 11.5% (or a post-tax return of 8.3%). We note that, arguably, this return appears to be on the high side. However, we offer these figures without having conducted a detailed appraisal the company accounts.

5.2 Some observations about value for money

The original contract appears to have been influenced by budget management considerations rather than an optimal pricing perspective, although the existence of an initial business case suggests that prices may have reflected overall costs at the outset. Renewal of the contract and subsequent variations to its terms have sought to maintain the overall funding amount, while reallocating funding towards the mobile surgical service to better reflect cost movements, although no “bottom-up” costing exercise has been undertaken. In the absence of a full “bottom-up” costing exercise being undertaken, attempts to assess service cost-effectiveness necessarily rely on this type of partial, contract-based approach.

The apparent gap between the price paid to MSS Ltd and the national case-weight price used by DHBs, of around 33%, may have been driven by cost differences such as scale effects, rural coordination efforts, and idiosyncratic costs (e.g. fuel, staff travel). Factoring in the costs of hosting the surgical bus, largely borne by DHBs, increases this premium to 39%. However, there are several considerations that point to value for money being better than this metric, on its own, might suggest.

- When factoring in actual performance (e.g. over delivery of contracted volumes) and the avoided travel costs then this “gap” is significantly reduced.
- The national CWD price grew at a much faster rate than the MSS Ltd effective price between 2006/07 and 2012/13. If the price path for the national price for case-weighted discharges reflects inflationary pressures faced by DHB provider arms, then MSS Ltd may have faced greater pressures to find efficiencies, relative to DHB base hospitals.

¹⁹ We examined annual reports from Southern DHB and West Coast DHB for 2012/13.

- There are also non-financial benefits, beyond the benefits considered above (i.e. the lower “did not attend” rates and avoided travel costs). Principally, these other benefits comprise reduced barriers for some patients to access their elective surgery (i.e. 20% of patients, equivalent to 300 people, who would not otherwise travel) and “convenience” in the form of avoided travel stress and/or apprehension about visiting a hospital.

We would conclude that in relation to the delivery of mobile surgical services, **it is plausible that MSS Ltd is operating as cost-effectively as the alternative of base hospital delivery.** This view is offered without fully knowing the underlying cost structures and whether there is ongoing cross-subsidisation from the other services towards the mobile surgical service.

Arguably, if the mix of cases is oriented towards planned and low complexity day surgery, **it might be expected that the mobile service should be more cost-effective** than a base hospital – particularly for a nimble provider that contracts in specialists without facing overheads, such as the professional development requirements of salaried clinical staff.

6. Rural professional development services

6.1 Service provision – training given locally

The rural professional development component of the contract specifies the following categories of outputs:

- Continuing Professional Development (previously known as “Skill Link”);
- Surgical Skills – Nurses;
- Surgical Skills – GPs;
- Advanced Clinical Practice Skills; and
- Conferences for rural health practitioners.

The services are provided via a range of channels, and these include:

- on-the-bus observation and working with the surgical team. This experiential training typically relates to the Surgical Skills and Advanced Clinical Practice Skills;
- face-to-face teaching sessions;
- the use of information technologies (IT) for remote teaching sessions. This is referred to as “telepresence” and is typically used for Continuing Professional Development; and
- the annual conference for rural health professionals (typically accompanied by targeted training sessions for rural nurses who work on the mobile surgical bus).

6.1.1 Rural sites choose their Continuing Professional Development sessions

The remote teaching sessions for the Continuing Professional Development stream are by far the largest volume of interactions. We spoke with managers, education coordinators and participating nurses at a range of rural sites that receive sessions via a telepresence link.

A list of possible topics and presenters is circulated to the rural sites each quarter. Rural sites have a say in choosing training topics, typically looking at the list of potential sessions on offer from MSS Ltd, and selecting the topics they feel are most relevant. The topics vary considerably, and the box overleaf provides a non-exhaustive sample. Some sites hold a week of one-hour sessions during lunch breaks, up to three times a year. A day-long block training course is another option, where the topic and audience interest justifies it.

I look for issues coming up and staff suggest ideas. I check their list and they’re responsive to requests. We set the programme together, usually holding it during lunch breaks.

We’ll look at our relevant topics of the moment that we want to expose staff to. Then we make up the timetable and put it out to all staff, who may volunteer.

We get to choose the topics every three months... We have a good working relationship with them and they provide a list of presenters. It’s good to have a mix of length of sessions, for example, we had a day-long course on infection control.

Continuing Professional Development sessions – example topics

- Palliative care
- Health assessments
- Emergency care
- Rural health
- Resuscitation
- Wound care
- Coronary care
- Dementia, depression and delirium
- Seizure disorders
- Multi drug resistant organisms
- Acute diabetes
- Chronic disease
- Chronic pain / Pain management
- Obesity and nutrition
- Elder care
- Women's health
- Mental health
- Maori health
- Continence

6.1.2 Continuing Professional Development sessions are seen as relevant and engaging

We asked participants about the relevance of the content of the sessions and the responses were uniformly positive. Some participants highlighted occasions where they felt the topic or presenters had been tailored to their rural context.

Emergency triaging – this was very suitable. It's relevant for here because we do a lot of that as a medical practice in a smaller town. The courses suit rural places... as we handle emergency care and triaging that those in urban centres probably wouldn't.

The subjects are relevant to rural health, for example, the paediatric emergency session.

A stroke speaker called up to find out about our pathways to tailor the presentation to us.

Several nurses commented that they felt they were getting access to experts from other parts of the country with high quality content that may not otherwise hear from.

Often the trainers are from large urban hospitals – so they deal with these cases all the time and so they're the appropriate people to talk with.

Cardiac nurses, diabetic nurses... They're all really qualified nurses in their own field.

The training provides access to topics that you wouldn't otherwise be exposed to.

Most rural sites where we spoke with participants, commented that they had high overall levels of satisfaction, borne out by strong attendances at the sessions. Two sites did comment that their attendee levels have fluctuated, but this may be more their workload pressures and planning than about the quality of sessions. A couple of interviewees also mentioned that they would find it valuable to hear more perspectives from peers in a similar position – how they manage the systems and process that are specific to a rural hospital. .

At times we may not have had the numbers, but that's due to our internal planning.

It's a systems and resourcing issue not a quality-of-training issue.

6.1.3 The opportunity to link with local peers is valued

Several interviewees at rural training sites commented that the sessions were open to all health care providers in their community and that they valued a chance to build and maintain relationships, for example with general practice, hauora providers, district nursing, rest home nurses and allied health workers – among others.

We link up with staff from other providers and learn how they do things. By training together, you understand their role and what they do, so it's easier to pick up the phone.

We get to learn with other nurses within [the rural site]. We know we've had the same training as each other, and that helps to strengthen the collegialism.

The rest home staff and ambulance staff can drop in too. It's good local networking.

6.1.4 The telepresence experience is seen as high quality

Several participants commented on the quality of the telepresence experience, as provided by the “Viper” units installed by MSS Ltd at participating rural sites. In some cases, commercial network limitations mean that the “sat van” is parked outside to enable a satellite-based link.

It's almost like being the room with them – they can see everything and can ask questions.

The quality of the link means there's no delay and the specialist can see everyone there.

You need that quality, otherwise people turn off. With the Viper, you can see presentations and interact. It has to make you feel you're in the room and that's what the Viper does.

6.2 Impacts and outcomes – a valued service

6.2.1 Evidence of some application of skills

We asked participants of the telepresence sessions and sessions aboard the mobile surgical bus about whether their experiences and skills acquired were useful for their usual roles.

Several of the nurses commented that this was the case – typically those that work in wards or an emergency department, rather than those assisting with outpatient clinics. The perceived benefits of this training are covered in Section 4.1.7, but largely relate to airway management and resuscitation skills. A couple of nurses commented that the skills would be useful if they were to move to a role at a base hospital where surgery is regularly performed.

In terms of Surgical Skills for GPs, one general practitioner commented on that a training session aboard the bus had improved his skills as a GP with special interest in minor surgery.

It was one of the best training opportunities I've had... Performing minor surgery alongside the surgical team, there's no substitute for that learning. Since then, I'm performing better and I'm more confident... for example, being bolder about the margins around lesions.

We also received feedback that members of the Rural General Practice Network tend to view the mobile surgical bus and the training opportunities aboard very positively. Access to a day of surgery allows the opportunity to spend extended time with the specialist. As one general practitioner commented, this can have dual benefits – not only the acquisition of practical skills, but the chance to seek advice about patient management.

Certainly it enhances access to education for GPs. There are the practical skills – the intubation of patients is useful when comes to an emergency situation...

We'll have cases they won't accept for outpatient referral... but standing alongside a specialist you can explore that case and improve your ability to manage it in the community.

In terms of Advanced Clinical Practice Skills, we heard from one senior medical officer, about the value of being able to train alongside the anaesthetists on the mobile surgical bus. This is included as a case study – see the text box overleaf.

6.2.2 Limited findings on recruitment and retention

We did not find managers arguing that the training sessions or opportunities to work on the bus are material factors in their nursing workforce recruitment or retention. A couple of managers commented that the nursing roles in their rural hospitals tend to be settled and typically sought-after “generally they’re coming to our door”.

Two organisations did comment that they valued being able to offer training aboard the bus to their general practitioners. In one case, it may have helped with the recruitment of doctors to work in a rural hospital setting.

We've offered some roles for our GPs to observe on the bus twice, and also our visiting medical students. We can offer them that – the chance to work with an anaesthetist.

The bus has helped us manage with the recruitment of doctors. We can offer a GP who may work in the rural hospital, a chance to work on the bus, where they have the support...

6.3 Economic considerations of training

The rural sites appear to value the service and particularly the fact that they can access the training at no direct financial cost. We asked rural site managers and participants of the Continuing Professional Development sessions about how they would manage in the absence of the service. The common response was that they would have to fund staff to travel to obtain training to meet Continuing Medical Education obligations and that would come with costs that would stretch training budgets. Some training may become uneconomic to secure and would not otherwise happen. A manager at one rural hospital stated that they would consider paying for the education sessions, as the staff sees them as being so valuable.

It'd be more costly for the organisation. We'd support some people to travel outside the region, but you don't always need the whole day. So I'd have to pay for them to drive there for a part day and that's getting costly.

There are other online services, but they're not as interactive or as regular... We can do courses in [a main centre] or bring someone in, but that's an added expense for us.

In term of Surgical Skill training for GPs, it appears that coordination function handled by MSS Ltd is more efficient than one general practitioner commented that the service made the coordination of the training opportunity so much easier.

That sort of education wouldn't happen otherwise. You'd need to take a day out of your practice and travel to a base hospital and you would've had to have chased up and persuaded a specialist, saying "I want to come and observe and to be observed". So you'd have to organise it yourself. It wouldn't have happened otherwise.

Case study: An application of intubation training

A senior medical officer who works at rural hospitals, and who regularly trains aboard the mobile surgical bus, recounted an occasion where those skills were used in an emergency.

The situation

A patient presented to the senior medical officer at the emergency department of [a rural hospital] on a Sunday evening. The patient was not feeling well, having recently had laser treatment on the vocal cords.

I could hear that the patient had developed noisy breathing. The situation quickly deteriorated to the point where the patient could not breathe because of a swelling in the vocal cords following surgery and was lapsing into unconsciousness.

The medical intervention

It was apparent that the patient required an immediate intubation – insertion of an endotracheal tube to open the airway and enable ventilation. This invasive procedure typically requires anaesthesia.

Before intubation, I had to take steps to sedate the patient using propofol and then administer medications to paralyse the patient so as to reduce any risk of vomiting. I then inserted the endotracheal tube to enable ventilation.

The outcome

By the time the patient was transferred to [a base hospital], the oxygen levels in the blood were normal and the patient was being ventilated. The patient remained in the intensive care unit for a couple of days before making a complete recovery.

An ambulance came to fetch the patient (as the rescue helicopter was unable to fly that evening due to weather conditions), but this took over hour and a half and the patient wouldn't have survived without that procedure.

The impact of the training

The senior medical officer valued the opportunity to regularly assist aboard the mobile surgical bus as one way to help maintain these skills.

My experiences on the bus meant I had more familiarity to competently and safely deal with the anaesthetic drugs involved and to take steps to stabilise the patient. For example, the drugs reduce blood pressure and so you think ahead to compensate to avoid cardiac arrest.

It's about having the skill to correctly place the tube in the airway. It's not straightforward and you have to avoid the oesophagus. I teach Advanced Cardiac Life Support, but practicing on mannequins is not the same, as you can't duplicate the anatomical nuances.

This refresher experience is crucial, as you don't deal with these situations frequently enough in smaller centres, but they do occur. So I value being able to access the bus.

7. Remote collaboration

We also considered the remote collaboration –a service component that accounts for a small share (approximately 6%) of the annual funding stream. The original intent of the remote collaboration component was to use the telepresence technology to enable clinicians in smaller hospitals, including base hospitals, to link up and collaborate with their counterparts in larger urban hospital. Potential purposes were thought to include mortality reviews, difficult cases for diagnosis, and surgical observation.

We understand that it proved difficult to bring sufficient clinicians on board for the practical delivery of this concept. The focus has increasingly shifted into other areas where there is scope to use the technology, such as supporting rural participation in conferences and medical student immersion in rural settings.

One example was the Rural Medicine of Australia conference, where experienced rural general practitioners in New Zealand were linked into relevant sessions and able to participate. Another example is the Rural General Practice Network conference, which has been supported for the last few years. The telepresence technology allows the conference to be beamed to rural hospitals and broadcast online to members who were unable to attend. A member of the Network commented as follows.

I can't speak highly enough – the outcome is that more members can participate even though they're not at the conference. The equipment which allows us to broadcast via the web... that has been phenomenal in the way it has enhanced the utility of the conference. We also had a tele-link from Dargaville to the conferences... and so they were able to participate.

MSS has assisted with the University of Otago rural immersion programme for medical students. The students are based in rural settings in places such as Masterton, Blenheim; Balclutha; Dunstan; Greymouth. They are able to beam back to a tutor in Dunedin, which means that the 50 or so students now no longer need to be based in or near Dunedin or Christchurch.

Linkages with Monash University in Victoria, Australia have also been fostered, and this appears to be within the “international connections” element of the contract. The Monash Churchill campus has linked its school of nursing – using MSS equipment – to the surgical bus and to Otago University. Tele-tutorials have been held between medical students at Monash and at Otago, for example, emergency medicine skills and procedural skills in general, and we understand that these have been well received by students.

These links with Monash and rural Victoria have also been drawn on for remote collaboration sessions involving rural practices at either end. A medical centre in Opotiki was linked to a rural health clinic in rural Victoria, as a demonstration of the use of telehealth. A specialist in Opotiki interviewed a patient in Victoria and advising the general practitioner there on the management of a chronic ulcer. This was followed by a case discussion among staff from each rural clinic and shared perspectives on after-hours care in a rural setting.

8. Concluding remarks

8.1 Mobile surgical services

There is sufficient evidence to conclude that the mobile service improves access for rural patients, and in particular, those patients who are from groups that tend to have high health needs, suffer from health inequalities, and /or face barriers to accessing care.

- The patients tend to be children and young people (41% of discharges) and people aged 60 years and over (27% of discharges), although this level of access is enabled by the mix of services offered on the bus (e.g. dental, endoscopies). Also of note, patients who identify as Māori comprised 24% of discharges – around 6 percentage points higher than their share of the rural population. These patients have been assessed by their DHB as meeting the threshold for surgery and so the mobile service can be seen as helping to support their access to care.
- Although the majority of patients treated on the bus would have travelled further for surgery, for example to their base hospital, around 20% stated that they would not. This figure is not insignificant and implies that up to 300 rural patients per year, who have been prioritised for surgery by their DHB, may not otherwise access the care they need. Some of the reasons cited by these patients include: no access to transport; too costly to pay for transport, food and accommodation; and the logistical issues of child care.
- Stakeholders at rural host sites tended to comment that, in the absence of the mobile service, some patients may not be able to travel further to a base hospital for surgery. These stakeholders – including general managers at several rural hospitals, rural nurses, a clinical manager at a hauora provider and a rural general practitioner – typically mentioned children in struggling families or older people and cited reasons such as a lack of transport and/or money, and the distance involved.

Patients and their caregivers overwhelmingly perceive their experience of the mobile surgical service to be a positive experience. There is strong evidence that rural patients and their caregivers value the “convenience” of the service being close to home. This term is variously used to cover reduced travel time or direct travel costs, not having to take time off work or make alternative child care arrangements, and avoided stress or apprehension.

No concerns were raised about the safety and effectiveness of the service. None of the clinical staff involved expressed concerns about the current scope of procedures being performed or the follow-up care. Consistent with this, the majority of patients reported that they have experienced improvements in their wellbeing following their surgery on the bus.

DHBs appear comfortable with referral pathways and waiting times. The district health boards that we spoke with appeared to be satisfied that the referral pathways and waiting times for the mobile surgical service did not place rural at any systemic or material disadvantage, relative to their non-rural counterparts that live closer to a base hospital (or vice versa). The bus was seen as small but useful supplementary capacity, helping DHBs to manage the shorter targets for patient waiting times. We conclude that the capacity is the equivalent of one additional day surgery list per month for most host DHBs, and up to one extra list per week for DHBs with multiple hosting sites.

Rural sites are highly supportive of the mobile service. In most, cases the rural hospitals and their local communities were highly welcoming of the bus and the opportunity for local nurses to work on board. Many saw the bus as something of a replacement for earlier loss of surgical services, following a centralisation of surgery during the 1990s.

It is not implausible that the mobile surgical service is operating as cost-effectively as the alternative of base hospital delivery, once the effective contract price is adjusted to take account of over-delivery of volumes, and avoided costs. This view is offered without fully knowing the underlying cost structures and whether there is ongoing cross-subsidisation towards the mobile surgical service from the other components. In the absence of a full “bottom-up” costing exercise, any further attempts to assess service cost-effectiveness will continue to rely on this type of partial, contract-based approach.

The rates of return appear to be at the high end. We were advised by the provider that the pre-tax return on the cost value of the asset base employed in the business for 2012/13 was 11.5% (or a post-tax return of 8.3%). However, we offer these figures without having conducted a detailed appraisal the company accounts.

The service has demonstrated that it is well-planned and well-managed by the fact that the bus reliably turns up at two dozen sites on a regular five-week cycle, largely without incident. Stakeholders could only recall one recent vehicle breakdown – a case where the provider was prepared to go the extra mile to ensure the surgical list was not cancelled. Furthermore, the staff employed or contracted by MSS Ltd were seen by stakeholders as “flexible” and willing to discuss other approaches, while patients and caregivers generally rate their experiences with staff very highly.

We would conclude that the mobile surgical service largely fulfills the objectives set out in the contract – of providing access to a (reasonably) wide range of day surgical procedures in rural communities in a timely way. In doing so, there is evidence that it is improving access to elective surgery for patients in rural communities and assisting DHBs to, at the margin, meet their elective surgical services key performance indicators.

8.2 Rural health professional development services

Continuing Professional Development sessions are seen as relevant and engaging. Participants were uniformly positive about the relevance and quality of the content of these telepresence-based sessions, which form the largest volume of professional development services. Some participants highlighted occasions where they felt the topic or presenters had been tailored to their rural context. Several participants also commented that the sessions can enable local networks to be built and maintained, as the training open to other providers located in and around the rural sites.

There is some evidence that the skills are being applied. Several of the nurses commented that the training on patient airway management and resuscitation skills would be applicable to their roles – for those working in wards or emergency departments of rural hospitals. In terms of Surgical Skills for GPs, access to a day of surgery allows GPs an opportunity to spend extended time with the specialist. As one general practitioner commented, this can have dual benefits – not only the acquisition of practical skills, but the chance to seek advice about patient management

The training may not be material for recruitment and retention. We did not find managers arguing that the training sessions or opportunities to work on the bus are material factors in their nursing workforce recruitment or retention. A couple of managers commented that the nursing roles in their rural hospitals tend to be settled and typically sought-after. Balancing this, two organisations did comment that they valued being able to offer training aboard the bus to their general practitioners. In one case, it may have helped with the recruitment of doctors to work in a rural hospital setting.

8.3 Remote collaboration services

Remote collaboration has refocused to include rural conferences and a rural immersion programme. We understand that it has proved difficult to bring sufficient clinicians on board for the practical delivery of this concept, which had envisaged clinician collaboration over mortality reviews, difficult diagnoses, and surgical observations. The focus has increasingly shifted into other areas where there is scope to use the technology, such as supporting rural participation in conferences and medical student immersion in rural settings.

Arguably, much of the activity being carried out under this component is part of a broader education/professional development theme. It might make sense to consider how funding and reporting could be simplified under one component that covers the current activities under the rural professional development and remote collaboration components.

8.4 Looking across the services

Some signs of “Better, Sooner, More Convenient”. Looking across the services we found some signs that they are consistent with the objectives of service integration articulated under the “Better, Sooner, More Convenient” initiative.

- Rural patients, often from relatively high-need groups, are able to access elective day surgery in a way that is closer to home and “more convenient” for them;
- Some new patient pathways being supported or enabled by the mobile surgical service, for example, in one case, a DHB had approved a GP with a “special interest” to handle community-based first specialist assessments and referrals to the mobile surgical service.
- Specialists are sharing knowledge to enable patients to be better managed within the community. There was an example of a GP being able to draw on training from a hospital-based specialist while aboard the surgical bus. This meant improvements in the delivery of minor surgery in a rural medical centre and advice on how to manage certain patients who would not meet the threshold for outpatient referral.

Rural professional development and remote collaboration appear to fit well. The service components of rural professional development and remote collaboration appear to naturally fit together in that both services tend to use the same telepresence capability, infrastructure and networks of people.

The mobile surgical service could be seen as separate. As for any inherent relationship between those services and the mobile surgical service, it is not clear that it is necessary in an operational sense. The telepresence function does not appear to be used in relation to mobile surgery, other than for demonstrations – which could happen at any base hospital. Nevertheless, there may be some efficiency to be gained from having the surgical and telepresence components delivered by same provider (e.g. shared corporate overheads).

References

Agreement between Her Majesty the Queen in Right of Her Government in New Zealand (acting by and through the Ministry of Health) and Mobile Surgical Services Limited. (488412/308410/00)

Bax, K., S. Shedda, and F. Frizelle (2006) “The New Zealand Mobile Surgical Bus Service: What is it achieving?” in *New Zealand Medical Journal*, Vol 119, No 1236

Central Region’s Technical Advisory Services (2006) *Review of the Mobile Surgical Service*. Prepared for the Ministry of Health. May 2006. Wellington: Central Region’s Technical Advisory Services

Lethbridge, L. RN, Bachelor of Nursing Honours. *A Literature Review: Nursing Assessment in a Post Anaesthetic Care Unit*. Belmont Hospital. Undated.

Ministry of Health (2010) *DHB Hospital Benchmark Information. Report for the Quarter January - March 2010*. Wellington: Ministry of Health

Ministry of Health (2011) *New Zealand Casemix Framework For Publicly Funded Hospitals including WIESNZ12 Methodology and Casemix Purchase Unit Allocation*. Available from http://www.health.govt.nz/system/files/documents/pages/wiesnz12-final-v1-1-25112011_0.pdf

National Health and Disability Ethics Committee (2012) *Ethical Guidelines for Observational Studies: Observational research, audits and related activities*. Revised edition. Wellington: Ministry of Health. Available from www.neac.health.govt.nz

National Health and Disability Ethics Committee (2012) *Standard Operating Procedures for Health and Disability Ethics Committees* Wellington: Ministry of Health. Available from www.neac.health.govt.nz

NZQA (2010) *Report of External Evaluation and Review - Mobile Surgical Services* 11 May 2010

Statistics New Zealand (2013). *2013 Census QuickStats About National Highlights*. Available from www.stats.govt.nz

Variations to Agreement between Her Majesty the Queen in Right of Her Government in New Zealand (acting by and through the Ministry of Health) and Mobile Surgical Services Limited. (488412/308410/01, 488412/308410/02, 488412/308410/03)

Appendix 1: Stakeholder interview list

Interviews with 34 selected stakeholders were carried out during the period December 2013 to February 2014. Table 8 summaries the interviews by their role. Further details have been withheld to maintain anonymity and ensure interviewees were able to speak freely.

Table 9: List of stakeholder interviews

Category	Individuals
Rural hospital managers & administrators (9)	Hospital general managers (6) Booking clerks (2) Education coordinator (1) Interviewees were located in six rural hospitals.
DHB service managers & coordinators (5)	General manager of surgery (1) Service managers (3) Clinical nurse coordinator (1) Interviewees were located in three district health boards.
Clinical staff working on the surgical bus (5)	Clinicians (2) Anaesthetist (1) Anaesthetic technician (1) Charge nurse (1)
Rural nurses (5)	Clinical nurse manager (1) Registered nurses (3) Dental nurse (1) Interviewees were located in four rural towns.
General practice (3)	General practitioners (2) Practice manager (1) Interviewees were located in two rural medical centres.
Community representatives (2)	Community trust chief executive (1) Town mayor (1) Interviewees were located in two rural towns.
Educators (2)	Medical school directors (2) Interviewees located in New Zealand and Australia.
Hauora providers (2)	Manager (1) Clinical manager (1) Interviewee was located in two rural towns.
Ministry of Health (1)	Contract manager (1)

Source: Sapere Research Group

Appendix 2: Assessment of patient research against HDEC criteria

Purpose

This Appendix outlines our assessment of our research against the criteria of the National Health and Disability Ethics Committee (HDEC).

Approach

The HDEC has set out the standard criteria to be considered when determining whether or not an ethics review and ethics approval is required. We self-assessed our research methodology against the flow chart, on the following page, from the HDEC Standard Operating Procedures handbook. We worked through the relevant questions, namely:

- 1: Main criteria column
 - No: this study does not involve a human gamete, embryo or hybrid embryo
 - Yes: this study does involve consumers of health and disability support services
- 2: Exemption column
 - No: it does not involve a medical device as part of the study (we are not inserting or fitting devices as part of the study, although we might be asking about them)
 - Yes: the study is a minimal-risk observational study (i.e. we are observing and analysing information about a health service but are not altering the care or services that people receive as part of this study)
- 3: Inclusions row
 - No: this study does not involve the use of Guthrie Cards
 - No: this study is not funded by the Health Research Council
 - No: this study does not involve the establishment of a tissue bank

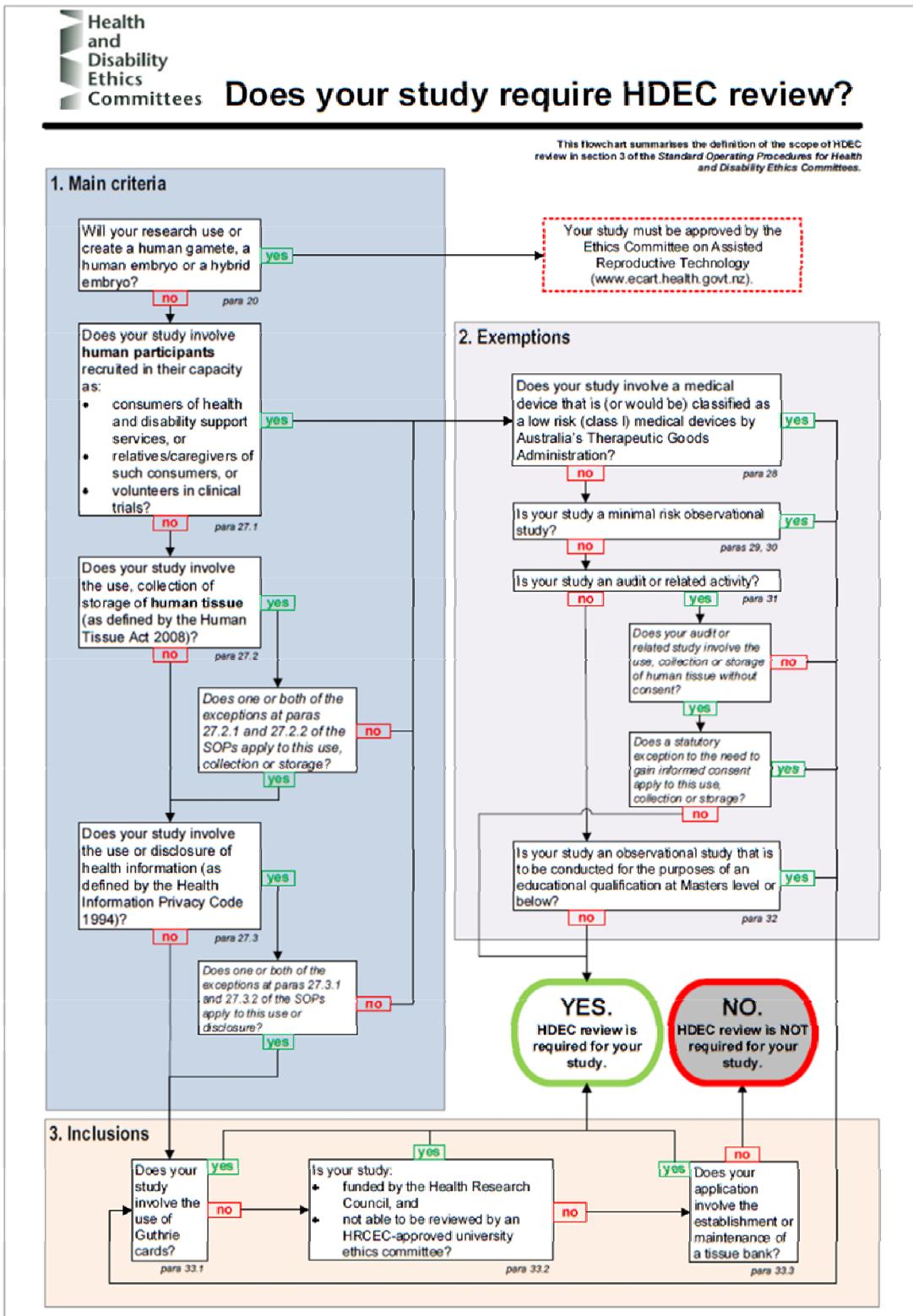
We note that, under HDEC guidelines, this project qualifies as being a minimal-risk observational study, and therefore does not require HDEC review, because:

- we are taking steps to ensure participants are giving informed consent to participate;
- we are not seeking vulnerable participants (i.e. who have restricted capability to make independent decisions about their participation in the study);
- standard treatments are not being withheld from participants;
- there is no storage, preservation or use of human tissue occurring; and
- there is no disclosure of personal health information without patient authorisation.

Conclusion

Our conclusion is that an HDEC review is not required for this project.

Figure 14: Assessing the need for HDEC review – summary flowchart



Source: National Health and Disability Ethics Committee (2012) *Standard Operating Procedures for Health and Disability Ethics Committees*, p.13

Appendix 3: Script for securing informed consent from patients

Brief script

The Ministry of Health, which funds the Mobile Surgical Bus, is undertaking a review of how things are working with the Bus. They have contracted Sapere Research Group to interview some of the patients.

As part of the review Jo Esplin from Sapere would like to talk with people who have had an experience using the bus.

They are interested in understanding from you what worked well, what didn't work well and what could be done better in future.

The results of the review will help inform how the services might change in the future. This is a normal part of always trying to improve what we do.

Can you help out by agreeing to be interviewed by phone by Jo Esplin? If you say yes I will give Jo your name and contact details and she will call you to make a time. Is that OK with you?

[Thank you and finish]

Additional information

Interviews will be about 15 and 30 minutes in length.

Sapere will keep all your contact details confidential to them and they will be stored in a secure place. The interviews will take place in January or February in 2014.

What your participation would involve

You may also want to talk about the review with other people, such as family, whānau, friends, or healthcare providers. Feel free to do this. If you agree to be interviewed Sapere will answer any questions you may have when they call you.

If you agree to have an interview, Jo Esplin from Sapere will phone you to make sure you are still keen. If you are then she will make a time that suits you to call you back for an interview, or you may agree to do it there and then. Your answers to the questions will be completely confidential (private). It is the themes they hear about from all the people that they are interested in.

If you have any questions about this review you can contact Jo on 027 233 4010 or her email at jesplin@srgexpert.com

ADDITIONAL INFO YOU MAY NEED TO USE

Your rights if you take part in the review

Whether or not you take part in the review is entirely your choice. If you don't want to take part, you don't have to give a reason, and it won't affect any health care you receive. If you tell us that you do not want to participate, we will not give your details to Sapere. If you say yes now, but change your mind later, you can pull out, or stop, at any time. You do not have to give a reason for saying no or stopping.

What will happen after the review ends, or if you pull out?

When Sapere has met and interviewed everybody, Sapere will write a report about the themes and summaries. The report will go to the Ministry of Health, who are responsible for the Mobile Bus services. The report will include what works well, what doesn't work so well and things they heard about what might be good ideas for any future changes to the way services are run. It will be up to the Ministry of Health as to how they share the report.

After this all your contact details will be deleted from Sapere Research Group's system.

Where can you go for more information about the study, or to raise concerns or complaints?

If you have any questions, concerns or complaints about the review at any stage, you can contact:

Jo Esplin, 027 233 4010, jesplin@srgexpert.com

If you want to talk to someone who isn't involved with the review, you can contact an independent health and disability advocate on:

Phone: 0800 555 050

Email: advocacy@hdc.org.nz

Appendix 4: Patient survey questions

Getting to the Bus

1. How did you get referred to the bus? (e.g. GP, hospital specialist, dentist, dental nurse, other)

2. How long did you have to wait from referral to your operation? (Circle the appropriate one) 0 – 6 months 7 to 12 months 12+ months

3. Did you get enough information before going to the bus so you knew what to do, when and what to expect? Yes / No

4. Who did you get the information from? (Circle one) Hospital, dentist, bus people, other

5. If you didn't have this service on the bus, would you have agreed to travel further to get it, e.g. to the next main hospital? Yes / No
If no, why not?

You, or your child's, experience of the bus: How was it?

6. Tell us about your experience with this service?
 - a. Was it on time or did you have to wait when you got there?

 - b. How would you describe your experience of the staff?

 - c. Did the operation / surgery go as expected? Yes / No (please describe)

 - d. Did you have enough information about what to expect and do after the operation?

 - e. After the operation was your / your child's health and wellbeing: (circle the relevant one)
1: Much better 2: A bit better 3: Same 4: A bit worse 5: Much worse
 - f. Anything else you want to say?

7. What did you **like / value the most** about being able to use the mobile bus service and why?

8. What did you **like the least** about using the mobile bus service and why?

9. Were your cultural needs met? If yes, how? If not, why?

10. Were your privacy and emotional needs respected and addressed? (please explain)

11. If there was anything to be different / changed with the service for the future what would it be? (If you have more than one idea, please rank them with 1 being the most important)

12. Contact afterwards

Did you know who to contact if there were any questions after the service? Yes/no

If yes, who was that? (e.g. the service, your GP, a hospital specialist, other)

Other

13. Is there anything else you want to say about the mobile bus service?

About you, or your child

14. **Tell us about yourself or your child:** (the person who received the service on the bus)

a. How long ago did you use the service? (month and year)

b. If you have used the bus more than once, how many times?

c. Age at time of use of the mobile service (circle relevant one):

- i. 0 – 10
- ii. 11 – 20
- iii. 21 – 64
- iv. 65 and over

d. Gender: Female / Male (circle relevant one)

e. Ethnicity you most associate with (circle relevant one):

- i. European
- ii. Maori
- iii. Pacific peoples
- iv. Asian
- v. Middle Eastern, Latin American, African
- vi. Other

f. What town do you live in (incl postcode if known)?

g. How long did you have to travel to get to the bus? (approx. minutes)

h. What is the total annual / yearly income of your household? (circle relevant one)

- i. \$0 to \$20,000
- ii. \$21,000 to \$40,000
- iii. \$41,000 to \$60,000
- iv. \$61,000 to \$100,000
- v. \$101,000 to \$150,000
- vi. \$151,000 +

i. What operation or condition did you have in the mobile bus? (circle relevant one)

- i. Dental
- ii. Endoscope
- iii. Ear, nose and throat (ENT)
- iv. Minor (general) surgery
- v. Gynaecology
- vi. Other
- vii. Don't know the name of it

Appendix 5: Characteristics of patient samples

This appendix provides additional information on the patients and caregivers sampled by Sapere Research Group for the telephone interviews and postal survey.

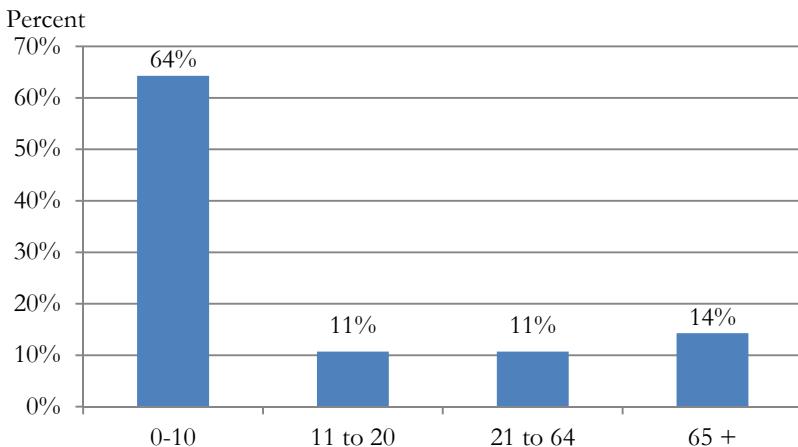
Patient telephone interviews

The sample of 28 interviews with patients and caregivers was randomly selected by the provider, from among those who had received day surgery on the mobile surgical unit during November and December 2013. Caregivers were interviewed if patients were under 16 years.

The age of the person having the surgery is presented in Figure 13. The sample contains a higher proportion of children aged up to 10 years (64%) than compared with those treated in the 2011/12 and 2012/13 (approximately 36%). Accordingly, caregivers of patients represented 71% of all interviews with the remaining 29% conducted directly with patients.

Nine out of 28 interviewees stated that the patient identified as Māori – approximately 28% of the sample. Unfortunately no interviewees identified as belonging to a Pacific peoples ethnic group, reflecting the low numbers of rural Pacific peoples and the small pool of patients during the interview period. Sixteen of the remaining 19 interviewees identified as being of European descent, with Asian and Middle Eastern being the other categories.

Figure 15: Patient telephone interviews, distribution by age group



Source: Sapere Research Group

Annual household income was canvassed by income brackets. Sixteen interviewees (57%) had less than \$40,000 annual household income and four (14%) were between \$41,000 and \$60,000 with 6 (21%) being over \$61,000. Two didn't know and no one was over \$100,000

As noted earlier, 20 (71%) of interviewees were parents and 8 (29%) were patients themselves. All had had the surgery in November or December 2013. The geographic locations they had had the surgery numbers 10 in total and included – in approximate geographic order – Kawakawa, Kaikohe, Warkworth, Pukekohe, Opotiki, Hawera, Levin, Kapiti, Featherston, and Takaka.

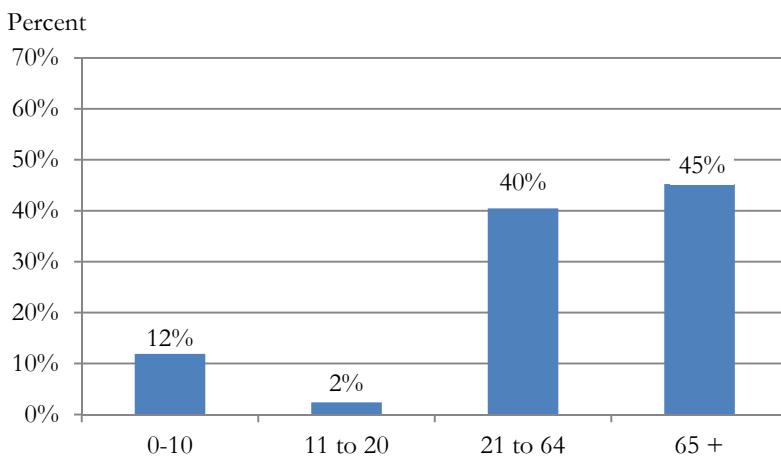
Patient postal survey

The sample comprised 43 patients and caregivers who mailed back questionnaires – a response rate of 27% for the 162 questionnaires sent. The sample was randomly selected by the provider, from among patients who had received day surgery on the mobile surgical unit during the calendar year of 2013. These covered patients at 21 locations.

The age of the person having the surgery is presented in Figure 14. The sample contains a high proportion of older people, with 45% being aged 65 years and over. This compares with approximately 20% of patients treated in the 2011/12 and 2012/13 being in this age group. The majority of responses (38 or 88%) were from patients, with the remainder being from caregivers.

Of those patients who stated their ethnicity, 5/41 identified as Māori – approximately 12% of the sample. Unfortunately, no interviewees identified as belonging to a Pacific peoples ethnic group. This is partly due to the small numbers of rural Pacific peoples being treated and partly due the response rate of the survey. The remaining 36 respondents identified as of European descent.

Figure 16: Patient mailed-back questionnaires, distribution by age group



Source: Sapere Research Group