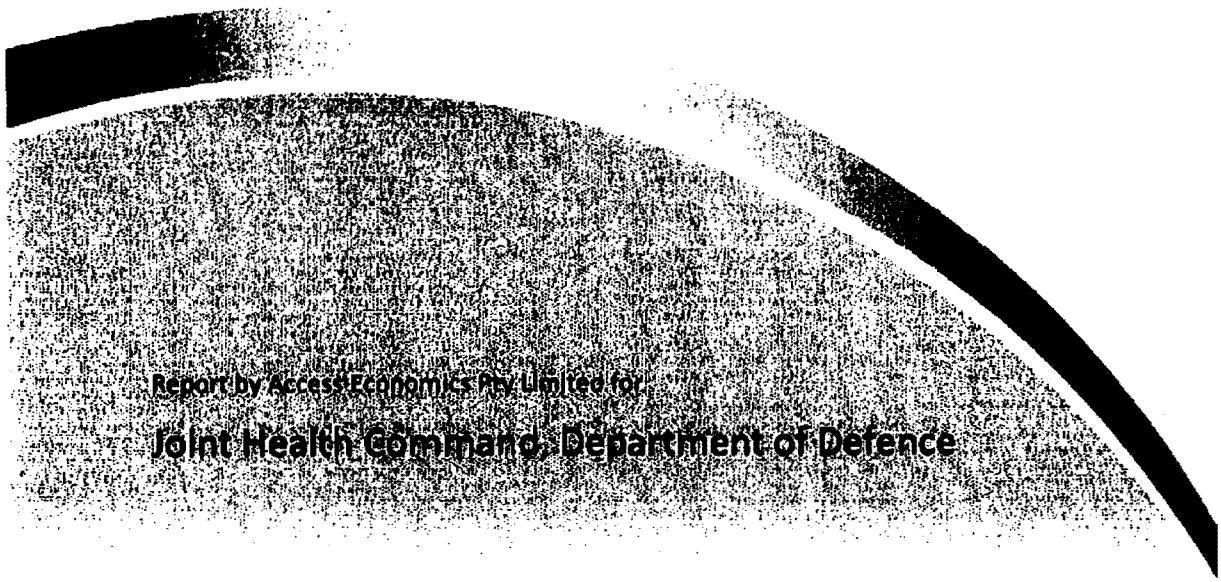
ACCESS ECONOMICS

Specialist health economic input in support of the Strategic Reform Program

26 October 2009



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Glossary of acronyms

ABS	Australian Bureau of Statistics
ACT	Australian Capital Territory
ADF	Australian Defence Force
AHA	Annual Health Assessment
AIHW	Australian Institute of Health and Welfare
ALOS	average length of stay
ANAO	Australian National Audit Office
APS	Australian Public Service
AWHC	Albury Wodonga Health Centre
AWMA	Albury Wodonga Medical Area
CIMHS	Critical Incident Mental Health Support
CIOG	Chief Information Officer Group
CME	continuing medical education
CMVH	Centre for Military and Veterans' Health
CPHE	Comprehensive Preventive Health Examination
CPI	Consumer Price Index
CT	computed tomography
DALY	disability adjusted life year
DFMP	Defence Financial and Management Plan
DI(G)	Defence Instructions (General)
DoHA	Department of Health and Ageing
DSG	Defence Support Group
DVA	Department of Veterans Affairs
(F)RACGP	(Fellow of the) Royal Australian College of General Practitioners
FTE	full time equivalent
GDP	gross domestic product
GP	general practitioner
HSB	Health Support Battalion
HSRP	Health Systems Redevelopment Project
ICT	Information and Communications Technology
JEHDI	Joint e-Health Data and Information
JHC	Joint Health Command
KPI	Key Performance Indicator
KRM	Key Reform Measure
MBS	Medicare Benefits Schedule
MEC	Medical Employment Classification
MEE	military employment expense
MIMI	Medical Information Management Index
NEHTA	National e-Health Transition Authority
NHMRC	National Health and Medical Research Council
NP	nurse practitioner

NSW	New South Wales
NT	Northern Territory
OHS	occupational health and safety
PA	physician assistant
PACS	Picture Archiving and Communication System
PBS	Pharmaceutical Benefits Schedule
PHI	private health insurance
POPS	Post Operational Psychological Screens (POPS)
PSP	professional service provider
QALY	quality adjusted life year
QLD	Queensland
RAP	Regimental Aid Post
R&D	research and development
RAAF	Royal Australian Air Force
RAN	Royal Australian Navy
RCIMT	Rehabilitation Coordinator Information Management Tool
RtAPS	Return to Australia Psychological Screens
SA	South Australia
SRP	Strategic Reform Program
TAS	Tasmania
UK	United Kingdom
US	United States
VIC	Victoria
WA	Western Australia

Executive Summary

As part of the Strategic Reform Program (SRP), Joint Health Command (JHC) is required to identify and realise $118 million worth of savings across the period 2009-10 to 2018-19, with the most significant savings likely to commence in 2013-14. This health economic analysis provides modelling which confirms that the projected JHC savings target is achievable, costing six Key Reform Measures (KRMs) currently underway and identifying another area for reform. Overall, Access Economics estimates that savings of $179.1 million are achievable over the target timeframe. Medium and high risk areas are identified for the projected JHC budget over the Defence Financial and Management Plan (DFMP) with risk assessment for the savings target.

Savings from KRMs and overall are summarised in the table below.

Summary of budget impacts of all SRP measures (nominal $ million)

Description	09-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	Total
KRM1 Rationalise facilities	0.0	-3.3	-6.3	-3.8	1.8	6.7	7.3	7.5	7.7	7.9	25.5
KRM 2 JEHDI	-	-	-	-	-	-	-	-	-	-	-
KRM 3 Integrated health workforce	3.6	7.4	8.9	9.2	9.6	10.0	10.4	10.8	11.2	11.6	92.5
KRM 4 Multi-disciplinary primary health care	2.5	2.6	2.7	2.7	2.8	2.9	3.0	3.1	3.1	3.2	28.6
KRM 5 Policy review	1.4	2.6	2.7	2.7	2.8	2.9	3.0	3.1	3.2	3.3	27.8
KRM 6 Industry partnering/ alliances	0.0	0.0	0.2	0.2	0.5	0.5	0.8	0.8	0.8	0.8	4.7
Net savings 6 KRMs	7.4	9.3	8.1	11.1	17.5	23.0	24.4	25.2	26.1	26.9	179.1

Source: Access Economics. Note: Includes capital and recurrent expenditure items.

KRM 1 analyses the rationalisation of the number of health facilities through hubbing. Key benefits comprise a reduction in the number of staff and lower operating costs for buildings. However, these gains overlap with other KRMs, notably KRM3 and KRM 4 below, and can be achieved only after implementation of KRM4 which reduces the demand for on-base floor space. In order to achieve savings, there must first be expenditure on refurbishment and new buildings, and net savings are not obtained until around 2013-14. The major savings are for Canberra and the Enoggera, Lavarack and Robertson Army bases, and the sum of savings for these sites is scaled up by 33% to allow for all other sites. The net savings from hubbing alone, excluding the associated savings achieved by KRM 4, are around $25.5 million.

KRM 2 While the Joint e-Health Data and Information (JEHDI) should prove highly useful for management and epidemiological purposes, given its early inception stage, Access Economics does not consider that it is feasible to model such savings at this time.

KRM 3 integrated health workforce, achieves savings of $35.7 million through converting contract health workers to APS positions. Savings of $56.9 million can also be achieved through using physician assistants (PAs) and nurse practitioners (NPs) to replace some GP positions.

KRM 4 It is difficult to assess with confidence savings from multidisciplinary primary health care. Potentially—and depending on existing facilities and scheduled closures—there may be around $27.8 million in savings to be derived from changes to the delivery of imaging, surgery, and in-patient care.

- Based on a case mix model derived from the agreement for the provision of health service to the Albury Wodonga Military Area (AWMA), there are potential savings of $15.9 million from the closure of operational diagnostic imaging facilities and outsourcing ADF needs on a fee-for-service basis.
- Based on data from the Duntroon Health Centre and RAAF Edinburgh and use a cost-per-procedure analysis, closure of the remaining operating theatres and outsourcing surgical procedures to civilian hospitals may generate up to $12.8 million in savings.
- Significant savings can be made from the reduction in size or conversion to low-acuity care of in-patient facility and increased use of community nursing, or a combination of these changes. Garrisons would need to be assessed on a case-by-case basis, and the cost of conversions, facility renovation and additional support offset against possible savings.
- Insufficient data was available to assess savings in pathology and ancillary services.
- Further savings may be achieved through contractual arrangements with providers to achieve further efficiencies and surety of service, but there was insufficient information to assess such savings at this point in time.

KRM 5 achieves $27.8 million in savings over the DFMP through policy review and rationalisation measures comprising:

- screening reforms from 1/1/10 providing savings of 9.1 million over the DFMP which include:
  - bowel cancer screening for members aged 50 years and over biennially rather than annually, in line with the National Bowel Cancer Screening Program and cost effectiveness evidence; and
  - bringing the timing of post-deployment annual health assessments (AHAs) in line with those for mental health screening (3-6 months rather than 3 months) and allowing final Separation Health and Dental Assessments to occur in the 12 months prior to discharge rather than in the 3-6 months prior, thus enabling a roll-in with the final AHA and annual dental examination and removing duplication (e.g. two tests potentially within a 6-month period);
- commencing 1/7/10, providing a 'standard' regime of health assessments for half of ADF members aged up to 40 – namely a CPHE every three years and allowing for an additional mid-triennium health visit rather than AHAs – reflecting that health service provision should be in line with the principle of being 'fit for purpose' (i.e. optimal) and thus depends on the needs of the person and individual requirements for operational readiness ($8.86 million); and

- reflecting the principle of equivalence with Medicare and the reality that civilians co-contribute 24% of their health costs on average (AIHW, 2009), introducing a much smaller (around 1% of the civilian amount) co-contribution of $12.27 per annum (for 2009-10, indexed to health inflation over time), ideally spread over services so as to represent a small incremental cost ($1 per health service is estimated to be adequate) and generating savings of $10.95 million over the DFMP.

KRM 6 achieves $4.7 million in savings over the DFMP through industry partnering and strategic alliances comprising:

- reforms to the current medical structure at [redacted] hospital commencing on or by [redacted] to realise savings equivalent to one FTE medical officer per annum; and
- reforms enabling similar sized savings at the [redacted] on or by 1/7/2013 and in Victoria (locations still being scoped) on or by 1/7/2015.

> Overall, potential DMFP savings achieved through these measures were estimated as $179 million.

Risk assessments

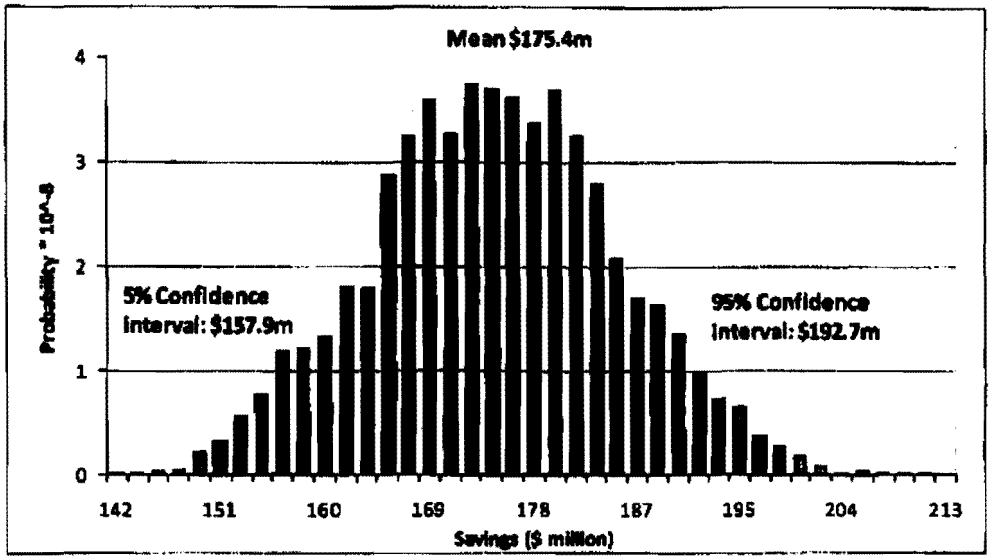
Risk assessments are provided in relation to costing the KRMs, since the modelling depends on a number of assumptions. Sensitivity analysis has been conducted using @Risk software.

In line with conventional actuarial risk assessment techniques, parameters considered most uncertain and with greatest potential to change overall outcomes were subjected to sensitivity analysis.

The results are reported in the Chart below, which shows that the expected value of the total net savings is $175.4 million. In addition, there is a 90% likelihood that total savings will be between $157.9 million and $192.7 million. This compares favourably with the target savings of $118 million.

- Net savings are most sensitive to changes in how many people aged under 40 have less frequent health assessments; the amount of co-contribution (if any); and success in converting contractors to APS positions.

Probability distribution of savings outcomes using @ Risk



Risk analysis for the overall budget

Historically defence health has had significant overspends, for example 18% in 2004-05 and an average of 9% over the last 5 years – when comparing the overspend against the allocated MEE budget expenditure.

The main risk to budget overspends appears to be contractors. Historical data indicate that variations in growth of contractor expenditure are correlated with growth in total MEE overspend. If the policy of converting contractors to APS staff is implemented this would help to reduce this element of budget overspend risk as APS are both less expensive and less prone to fluctuations in staff numbers.

Further, the command structure of defence health has now been reformed and is under a single Joint Health Command (JHC). This should give JHC the ability to oversee expenditure and implement savings initiatives. The implementation of the SRP gives JHC a strong incentive to control health expenditure growth. This can perhaps be seen in the declining overspend in recent years.

Another possible risk to the overall defence health budget is indexation. Access Economics' understanding is that in 2001 health expenditure was given its own index (possibly based on AIHW data). However, this index only applied for 10 years, whereupon it reverts to the standard index used across all Defence spending. This represents a significant budget risk as the current index is around 8% per annum whereas the non-farm GDP is expected to be around 3% over the next decade.

Access Economics

26 October 2009

1 Background

This introductory chapter sets out the context of the commissioning of this report and overarching contextual and methodological information that is relevant in relation to the analysis as a whole. Specific methodological issues and findings are then addressed chapter by chapter.

1.1 ADF health care – entitlements and access

Recruitment of Australian Defence Force (ADF) personnel ensures that only fit and healthy personnel are recruited. Defence Instructions (General) (DI(G)) Pers 16-15 (para 7) then notes the requirement for health care with the aim of continued operational readiness:

> *'ADF members must be able to carry out their specialist occupational functions, as well as general military duties, considering the arduous physical and mental stressors associated with operational duty. This duty often involves lengthy periods of operational activity with minimal medical support, limited or no respite opportunities, wide extremes of climate and other adverse environmental stressors. At the commencement of a period of operational service, military members must be free from any illness or disability that would restrict them from performing effectively under operational conditions or is likely to significantly deteriorate during the period of operational service. To be confident of an individual's capacity to perform all the required activities associated with an operational deployment, members are to achieve and maintain a standard of medical fitness as determined by their Service.'*[1]

To meet this aim, Defence Force Regulations[2] provide authority for the provision of health care to ADF personnel, with a basic entitlement to *'at least* the same level of health care as all other Australian citizens'.[3] That is, whilst the civilian standard underpins ADF health care it should not limit it.[4]

In current practice (in terms of entitlement and actual access), the 'equity with Medicare' principle means the ADF accepts responsibility for providing access to a wide range of defined hospital, medical and allied health services, including at least those that are covered by what Medicare and the public health system provide, and in some cases beyond that level in order to promote health to a standard higher than that of the average Australian. The higher standard encompasses the need for readiness (the ability to deploy at short notice for operations). ADF members thus generally do not pay the Medicare levy, are discouraged from using the Medicare and public health system (except in certain defined circumstances where

[1] Defence Instruction (Army) Ops 80-1 – *Army Individual Readiness Note*; Defence Instruction (Air Force) Ops 4-8 –

[2] 1952 regulation 58F(1) outlined in detail in DI(G) Pers 16-1 *Health Care of ADF personnel.*

[3] The legal framework governing provision of healthcare to Australian citizens is found in the National Health Act 1953 and the Health Insurance Act 1973 and regulations made under these Acts, supplemented by various Australian Government policies.

[4] Legal advice provided in April 2008.

Defence then reimburses such access), and have full ADF health records maintained (unlike civilians).[5]

The primary role of Joint Health Command (JHC) is to provide health care to ADF personnel to meet this entitlement[6] - specifically, treatment required to keep ADF members 'healthy for the purpose of discharging their duties'; subject to Ministerial determination of the conditions of treatment (taking into account treatment facilities available, the ADF member's duties and operational requirements). JHC's objective also emphasises the need for efficiency in this provision:

> *'to provide the most cost effective, efficient and ethical health service in support of the Australian Armed Services' (JHC Strategic Plan, 2009-10 to 2019-20:12).*

JHC's vision includes that:

> *'Resource usage will be managed with accountability, value for money and will be linked to readiness and other Defence related outcomes' (Ibid:14).*

Key performance indicators as summarised in Table 1.1 emphasise that the health system needs to 'meet all operational health requirements' (KPI1), be 'fit for purpose' (KPI3 and 5) and 'efficient' (KPI4).

Table 1.1: JHC Key Performance Indicators

Outcome	Description	Key Performance Indicator (KPI)
1	Provide a fit and healthy Force	The demonstrated ability to meet all operational health requirements
2	Prevent casualties	Decreasing incidence of preventable injury and illness
3	Provide health care	The demonstrated ability to retain and rehabilitate personnel to be fit for purpose Health facilities fully staffed with appropriately trained personnel
4	Develop health capabilities	Implementation of JP 2060 Phase 2 and JP 2080 Phase 3 - alignment of relevant training and doctrine
5	Manage and sustain the health system	Provide effective and efficient health care within budget Identify cost drivers to inform selection of optimum service delivery models Achieve a sustainable, fit for purpose, health workforce.

Source: JHC Strategic Plan, 2009-10 to 2019-20:12.

ADF members who are entitled to be covered by JHC services are detailed in DI(G) Pers 16-1 and Health Directive 919, and essentially comprise ADF permanent forces (including Gap Year personnel), Reserve forces serving on continuous full time service and, in some circumstances, Army General Reserve-Special Conditions Ready Reserve and others.[7]

[5] ANAO Report No 34 Australian Defence Force Health Services Performance Audit Tabled 27 May 1997 Para 2.8.

ANAO Report No 34 Australian Defence Force Health Services Performance Audit Tabled 27 May 199

7 Para 2.8.

JHC is responsible for providing all Garrison health care. Garrison health facilities are all those *within Australia* (those at Army/Navy/Air Force bases and in joint facilities) that provide health care to ADF personnel. Coverage does not include health care units on operational deployments or exercises overseas. While on such deployment or exercises, the services rather than JHC are generally responsible for health care. Garrison health care also funds RAAF Butterworth (Malaysia), Navy Fleet support (when personnel on Navy ships not on operational deployment receive health care at foreign ports when alongside) and care provided to ADF personnel and their recognised dependants on long term overseas posting.

1.2 Aim of this health economic analysis

As part of the Strategic Reform Program (SRP), JHC is required to identify and realise $118 million worth of savings across the period 2009-10 to 2018-19, with the most significant savings likely to commence in 2013-14. JHC is responsible for providing health support to the Australian Defence Force (ADF) in Australia (but not on operations).

JHC is required to submit a draft project plan for higher level endorsement and subsequently provide a reform options paper, including an option that meets the savings target together with any other sensible options for reform. A risk assessment of all options considered medium or high risk is to be provided and all proposed reform options must be reasonably costed. JHC must challenge all policy that might constrain the effective and efficient delivery of health services, and must provide by end of October 2009 sufficient information to enable higher committees to agree the savings targets in November 2009.

To this end, Access Economics was required to provide health economics modelling and a report (this deliverable) which:

- confirms whether the projected JHC savings target ($118 million as identified in the Defence Budget Audit) is achievable;
- costs the reforms currently underway;
- identifies any other areas for reform not identified by JHC;
- evaluates the current health services delivery model to identify medium and high risk areas for the projected JHC budget over the Defence Financial and Management Plan (DFMP); and
- evaluates through risk assessment the projected $118 million savings.

Reforms currently underway are referred to through the report as Key Reform Measures (KRMs).

- Chapters 2-7 review each of six KRMs specified in the Statement of Work provided to Access Economics by JHC and identify and quantify potential cost savings one by one.

Directive 284 for Reserves and 285 for Gap Year personnel details. When an injury or illness resulting from Defence service is suffered by a Reserve member while on continuous full time service, health care for that injury or illness is continued afterwards until the member transfers into the military compensation system administered by DVA. For routine health requirements, injuries or illness that are not related to Defence service, Reserves not on continuous full time service must consult their civilian health providers. Reserves serving away from their home locality can receive emergency and acute treatment until they return home as well as preventive care (e.g. sunscreen), and vaccinations or other health assessment or interventions at the request of the Service or Operational Headquarters for individual unit readiness or pre-deployment reasons. (DI(G) Pers 16-1, paras 7-9).

- Chapter 8 summarises other reforms identified that may also generate savings over the longer term, and as far as possible in the timeframe for this report measures the cost savings from such additional reforms;
- Chapter 9 presents a risk assessment in relation to the six KRMs (using sensitivity analysis) and to the JHC Budget overall; and
- Chapter 10 presents conclusions.

1.3 Overarching methodological issues

The process for this analysis involved a Project Inception Meeting (PIM) with JHC, after which a list of 69 questions was provided to JHC to request data, reports, contact information and other information as inputs to the analysis. A project management plan was provided one week after the PIM outlining detailed strategies and timelines for the analysis. Travel outside of the ACT for consultations was beyond scope. Contacts and data assimilation occurred thereafter, with detailed methodology for each KRM provided in later chapters in relation to specific information sources and modelling parameters.

1.3.1 Nominal reporting and the JHC budget

All calculations are presented in nominal dollars as per the JHC Budget for the SRP framework. The Budget provided by JHC to Access Economics was not the final budget since additional estimates are still in process. The emphasis of the analysis and report is on realising savings from the Military employment expenses (MEE) line of the budget ($270.044m in 2009-10) but this report also comments on savings that could be realised from other JHC budget lines (e.g. supplier expenses, JHC buildings Capital), and other areas of Defence or Commonwealth expenditure.

- The reason for this is that typically health investments generate savings outside the health expenditure 'silo'. For example, health expenditures can reduce personnel and administration costs by enhancing retention and recruitment. By rationalising health facilities or achieving efficiencies from outsourcing services, cost savings are made for Defence Support Group in terms of building maintenance and equipment. By introducing better e-health systems, savings may be made for Chief Information Officer Group (CIOG). Moreover, by keeping military personnel healthier through preventive health and quality care, savings can be made for the Department of Veterans Affairs (DVA). It is important to bear in mind that since many of the efficiency gains accrue outside of JHC, the savings identified in this report represent a Commonwealth minimum from the reforms reviewed.
- MEE include all costs associated with the employment of a uniformed member of the ADF. They include all salary, superannuation, housing costs (plus others) and any health costs (including outpatient, inpatient, allied health, pharmaceuticals, rehabilitation, mental health, psychology etc). In the JHC budget MEE refers solely to the health costs – all the other employment costs (salary, superannuation etc) are allocated to the respective Service i.e. Navy, Army or RAAF.

The 2009-10 Budget as at 28 August 2009 is provided in Table 1.2.

JHC Budget projections out to 2009-10 to 2018-19 as per the Defence Management and Financial Plan (DMFP) are in Table 1.3.

Table 1.2: JHC 2009-10 Budget as at 28/8/09

Directorate / AHS	Prime Contracts	Individual contracts	Sessionalists	Fee for service	Sub-total MEG	Suppliers	Other	Total
ADHREC	[redacted]							
AHS - ACT/SNSW								
AHS - GS/NNSW								
AHS - NQ								
AHS - NTK								
AHS - SA								
AHS - SQ								
AHS - TAS								
AHS - VIC								
AHS - WA								
AMI								
BUTTERWORTH								
CMVH								
DCM (a)								
DDFD								
DFPO								
DGS								
DHCD								
DHRJ (INC PMO)								
DMH (b)								
DMM								
DRS								
DSWD								
FAMILY HEALTH CARE								
FLEET								
HMLP								
JHSA - Exec								
JHSA - Medical Services								
OCJHLTH								
ODGCHM								
ODGGHS								
ODGHP								
OSGDHR								
OVERSEAS								
PRTG								
PSG								
Total	148,854,800	8,440,227	8,987,209	108,812,580	270,044,666	34,722,407	6,632,000	311,399,073

(a) 'Other' is revenue. (b) 'Other' is capital. Source: JHC.

Table 1.3: JHC Budget projections 2009-10 to 2018-19

	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total DMFP
MEE before savings	282.8	291.2	304.9	323.2	358.7	396.0	406.9	418.2	431.8	451.5	3,845.5
SRP Savings	-2.4	-2.4	-4.0	-8.0	-12.0	-17.0	-17.0	-18.0	-18.0	-19.0	-117.8
MEE with savings	260.4	289.8	300.9	315.2	346.7	379.0	389.9	400.2	413.0	432.5	3,527.7
Suppliers	33.4	31.0	33.6	22.6	31.0	25.5	28.9	26.5	30.3	28.0	291.0
Other	6.8	-	6.4	-	3.6	-	6.4	-	6.8	-	29.9
Sub-total	300.6	320.9	340.8	337.8	381.3	404.5	425.2	426.7	450.2	460.4	3,848.6
ADF Gap Year - MEE	4.5	4.6	4.7	4.8	4.9	5.1	5.2	5.3	-	-	39.1
Revenue	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.7
ELF1*	5.7	7.4	9.8	11.4	11.5	11.7	11.8	11.6	11.9	12.2	105.1
ELF2*	8.0	8.1	8.1	8.3	8.5	8.7	8.8	9.0	9.0	9.2	85.8
Total without ELF2	310.8	332.9	355.3	353.9	397.7	421.1	442.2	443.6	462.1	472.6	3,992.2
Total	318.7	340.9	363.4	362.2	406.2	429.8	451.0	452.7	471.1	481.8	4,078.0

Source: JHC. Note: The 2009-10 year in the projections does not align with data provided in Table 1.2. * JHC ELF Funding is yet to be confirmed.

1.3.2 Health price inflation and population growth

The Defence SRP keeps the share of Australian Government expenditure on Defence roughly constant at around 2% of Gross Domestic Product (GDP). In line with constant GDP share, growth in the Defence dependant population is thus inflated in line with population growth across Australia. Data for population projections are derived from the Access Economics Demographic model, which in turn is based on demographic data from the Australian Bureau of Statistics (ABS) mid-case projections for fertility, mortality, and migration patterns.

Health inflation has tended to run at rates higher than the Consumer Price Index (CPI). Health inflation data are derived from the Australian Institute of Health and Welfare (AIHW, 2009) historical series and compared to headline CPI, with the long term differential (0.4%) used to estimate the differential over the DMFP period. Headline CPI projections to 2018-19 are derived from the Access Economics Macroeconomic model.

Using these methods, estimates of population growth and average health inflation over the forecast horizon are presented in Table 1.4.

Table 1.4: Health inflation and population growth used in the modelling (% per annum)

Historical year	Health inflation	Headline CPI	Difference	Projected year	Health inflation	Population growth
1998–99	2.5	1.3	1.2	2008-09	3.5	1.31
1999–00	2.4	2.4	0.0	2009-10	2.2	1.30
2000–01	3.9	6.0	-2.1	2010-11	3.3	1.28
2001–02	3.3	2.9	0.4	2011-12	3.4	1.27
2002–03	3.5	3.1	0.4	2012-13	2.9	1.26
2003–04	3.5	2.4	1.1	2013-14	2.4	1.25
2004–05	4.2	2.4	1.8	2014-15	2.3	1.24
2005–06	4.0	3.2	0.8	2015-16	2.9	1.23
2006–07	3.3	2.9	0.4	2016-17	3.1	1.22
2007–08	2.9	3.4	-0.5	2017-18	2.9	1.20
Average	**3.4**	**3.0**	**0.4**	2018-19	2.9	1.19

Source: Access Economics modelling for projected years based on ABS and AIHW data for historical years.

1.3.3 Measuring health outcomes and cost effectiveness

Health outcomes are measured in Australia most commonly using 'burden of disease' methodology (Begg et al, 2007; Mathers et al, 2003), where the standard unit is the disability adjusted life year (DALY). Many other health state metrics can be converted to DALYs – for example, pain measured using a visual analogue scale pain score can be converted to a disability weight using DISMOD II, a modelling tool developed by the Australian Institute of Health and Welfare (AIHW). The disability or DALY weight can then be used (together with estimates of the duration of the pain and how many people experience it) to estimate the total years of life lost due to disability (YLD) from any given health state. YLD is one of two components of the DALY metric of wellbeing – the other is the years of life lost due to premature mortality (YLL).

- **Disability**: DALY weights are used to adjust a year according to the extent of disease burden experienced. Zero represents perfect health and one represents death. The concept is similar to that of a quality adjusted life year (QALY), a metric of wellbeing where zero represents death (or no quality of life) and one represents perfect health. QALYs can be used when DALY conversions are not possible. QALYs include no component for premature death.
- **Premature death**: YLLs can be calculated from the relative risk of death, the number of people who die from a condition and their life expectancies in the absence of that condition.

Cost effectiveness analysis measures costs in monetary terms and outcomes in natural units, in order to achieve a given improvement in a health state. In contrast, cost benefit analysis measures both the costs and outcomes in monetary terms (dollars in Australia). Since there is residual debate about converting health states such as DALYs into dollars (although this can be done by imputing the value of a statistical life year as the value of a DALY averted), it is common in evaluation to use cost effectiveness analysis and, in particular, cost utility analysis – a subset of cost effectiveness analysis where the outcome metric is a DALY or QALY.

Thresholds based on incremental cost effectiveness ratios (in $/DALY or $/QALY) can then be utilised in order to prioritise scarce resources and allocate them to areas where health gains can be made for an acceptable level of expenditure.

- Thresholds for health services provided to other Australians include Medicare Benefits Schedule (MBS) and Pharmaceutical benefits Schedule (PBS) funding, which use cost utility analysis and cost minimisation analysis techniques to assess thresholds of health service delivery for civilians). A variety of benchmarks are used to determine Australian public financing thresholds for purchasing a QALY or averting a DALY including:
  - gross domestic product (GDP) per capita i.e. around $52,000 in 2008-09 – in line with the World Health Organization guidelines that interventions whose cost effectiveness is between one and three times GDP per capita per QALY gained (or DALY averted) are cost effective and those less than GDP per capita per QALY gained (or DALY averted) are very cost effective[8],
  - $60,000 – in line with the Department of Health and Ageing (Applied Economics 2003); or
  - the value of a statistical life year of $151,000 in 2007[9].

[8] http://www.who.int/choice/costs/CER_levels/en/index.html Average GDP per capita for the Western Pacific region including Australia is shown as US$30,708 with three times that shown as US$92,123 in the year 2005.
[9] http://www.finance.gov.au/obpr/docs/ValuingStatisticalLife.pdf

2 Rationalisation of health facilities

Rationalisation can be considered in various categories:

- rationalisation across the three services;
- rationalisation of the number of health facilities within a base;
- rationalisation of the number of health facilities across a city or within a region;
- rationalisation of annual health checks; and
- rationalisation of the range of treatments that are in excess of military requirements.

Rationalisation across the three services is well under way with the creation of JHC. Whereas each of Army, Navy and Air Force has operated its own health facilities in the past, there is now the opportunity to harmonise health services across the three services, and for one facility to provide health services to more than one arm of the military services. This has required a change in culture and is only partly complete.

Rationalisation of the number of health facilities within a base or region has the ability to provide economies of scale in management and support services, and to ensure fuller utilisation of medical staff, buildings and equipment. Many small facilities are in use only part of the time. It should be emphasised that centralised primary health care can be organised in such a way that each person can still visit a preferred medical officer, as in the current arrangements for small facilities, if desired. It is recognised that consolidation of facilities will lead to increased time and cost for travel to and from health facilities.

Rationalisation of the number of facilities also has benefits that are difficult to quantify. It reduces the amount of information (mostly in paper form at present) that is transferred between facilities, and enables all records to be stored securely in one place. Larger groupings of doctors enable them to usefully compare notes on cases treated. The additional time to travel to a central health facility may reduce the number of consultations for minor matters.

There is also scope for rationalisation of the number of health checks and the range of conditions that are addressed within ADF health. These are addressed in the context of policy review in KRMS.

The analysis in this section is restricted to the rationalisation of the number of health facilities in the sense of consolidating services into fewer health facilities and the corresponding closure of some facilities. Other sections in this report address the mix of services that are provided on-base and off-base. This mix, in turn, affects the on-base requirements for buildings, equipment and staff. The analysis in Sections 4 and 5 takes account of the changes in labour costs associated with changes in the mix of on-base and off-base services, together with changes in the mix of ADF, APS and civilian health personnel, and the mix of contracts and wages. To avoid double counting, labour and equipment costs associated with changes in the on-base/off-base mix are not allowed for in this section, but the associated costs of buildings are included. However, new buildings are the financial responsibility of the Defence Support Group (DSG) and are outside the JHC purview. Financial responsibility for refurbishments is a grey area between JHC and DSG, while some of this funding could be attributed to the Enhanced Land Force program. The rationalisation of the number of health facilities, in terms

of JHC SRP savings, thus becomes an issue of whether there are any additional gains above and beyond those from KRM3 and KRM4. While rationalisation of facilities involves some refurbishment and improvement of buildings, it should not be seen as a substitute for ongoing programme of maintenance for buildings.

The practice for many years has been to have multiple health facilities, and this has been reinforced by the independence of the Army, Navy and Air Force. Furthermore, in the case of the Army, there has been the practice of having a separate health facility, known as a Regimental Aid Post (RAP), for each regiment, based on the concept that the regiment is a unit that works together and can be relocated as a whole. These multiple facilities are in conflict with the new philosophy of efficient provision of health services through joint health services. There is no clinical need to have multiple health facilities across a base, in terms of either regimental organisation or of quick access to health services. A regiment can still train as a whole and go on exercises together without the need for health services to be provided at its own RAP located separately from others.

Defence Health, in its various manifestations, has been examining alternative forms of health delivery for many years. There is a large range of options for the ways in which health services are provided, depending on the combinations of services that are provided on base and off base, and combinations of ADF, APS and civilian personnel that provide them. The suitability of options depends not only on costs but on assessment of the risks, and especially on whether an option is achievable realistically. It is possible that different solutions are appropriate for different bases and regions.

Recent assessments include Albury Wodonga health facilities (Grosvenor Management Consulting, 2006) and an extrapolation to facilities nationally (Grosvenor Management Consulting, 2007), the Cogent (2009) Review of ACT health facilities, and the KPMG (2009) Review of Darwin health facilities. Page 1 of the ACT study outlines the JHC's future service delivery model that has been under consideration for some time and, whilst it is still conceptual in its nature, has the following features (which overlap many of the KRMs in this report).

- A focus on integrated primary healthcare in the on-base environment.
- Diagnostic, specialist and hospital services will be purchased from external providers.
- Local care networks will be established.
- Where bases currently have a number of smaller medical centres, these will be 'hubbed' into a single primary healthcare centre.
- Primary healthcare centres will be staffed by ADF and contracted healthcare providers.
- ADF healthcare providers in deployable units will work from the primary healthcare centre when not deployed.
- Where appropriate, a cadre staff will be provided to manage the facility and provide continuity when ADF healthcare providers are deployed.
- Operating theatres currently on bases will be closed and surgery will be sourced from private providers.
- One/two additional centres of excellence/embedded ADF wards along the lines of the [redacted] in Sydney may be developed (e.g. Brisbane, Darwin or Perth).

JHC is actively investigating rationalisation of the number of facilities within many bases and between sets of bases that are near to one another. The need for review is reinforced in some cases by the existence of old buildings that are not fit for purpose. The ACT study proposes a rationalisation of health services which might be used as a blueprint for other locations. While the underlying objectives and principles will be the same across other locations, the solutions in terms of costs and savings are likely to be variations on the same general theme, with differences depending on local circumstances and requirements.

2.1 Sites identified as amenable to rationalisation

Rationalisation of the number of facilities is feasible at sites where there are several facilities within a travel time of, say, 20-30 minutes in metropolitan areas or within 30kms in rural or remote locations. This applies particularly to Army bases where in many cases there are multiple facilities located on one base. In other cases, times and costs of travel restrict the amount of consolidation that is practical, especially within cities.

This report focuses on rationalisations at just four sites, namely Canberra, Darwin, Brisbane and Townsville. In the ACT, the Army, Navy and Joint Command between them have three health facilities within 10 minutes of one another, and two others about 20 minutes away. The Cogent Review for the ACT has proposed that these be consolidated into a single facility.

The Army bases at Darwin (Robertson Barracks), Brisbane (Gallipoli Barracks at Enoggera) and Townsville (Lavarack Barracks) each have a central multi-service medical centre and a number of regimental facilities, most of which are used only for consultations and sick parade. There is also a separate dental centre at some sites. This report examines consolidation into a single facility at each of these three bases. Additional consolidations of Naval and RAAF health facilities have been proposed for Darwin, and additional consolidation of RAAF and other Army facilities have been proposed for Townsville, but these are not included in the present calculations.

Rationalisation of facilities could be repeated at some other locations throughout Australia in addition to Canberra, Darwin, Brisbane, and Townsville. Further gains could be achieved at sites such as Holsworthy by closure of small facilities and consolidating the services into an enhanced multi-service facility. On top of this, there is the potential for additional gains by re-allocation of existing services from bases to local providers, especially where there is insufficient use to warrant having staff and maintaining equipment on base.

The basis for the net savings in cost is reducing duplication of underused buildings and equipment, and realising gains from economies of scale in management, support services and the operating costs of buildings. Some small facilities are in use only part of the time. There is some scope for economies of scale in the provision of professional services by fuller utilisation of staff and equipment at a central facility.

In many cases surplus buildings are below satisfactory standards for building codes or for health use, and would require refurbishment before they could be used for alternative purposes. It is assumed that they have no residual value. Similarly, much of the surplus equipment, e.g. x-ray machines, is obsolete and has no market value.

Surplus professional staff would mostly be civilians on contacts. Given time scales of one to two years for implementing changes, it is expected that most contracts could run their natural

course without early termination and the possibility of penalties. Where there is excess demand in the community, especially for doctors, dentists and nurses, they should have little difficulty in finding alternative employment. Administrative and clerical staff are mainly from the ADF and APS and would be either redeployed or seeking positions elsewhere.

Consolidation of facilities would lead to travelling increased distances for some personnel, and hence increased travel time and cost. The costs of shuttle services are allowed for in the calculations. Any increase in time away from training is perceived as a high risk, but Access Economics considers that such objections could be accommodated with the right levels of commitment.

It is noted that in some cases there is the potential to achieve savings by taking services to personnel. One example is sending personnel home from hospital soon after surgery and using visiting nurses to care for them at home. Where special hospital facilities are not required, the home cost is much less than for a hospital bed.

2.2 Methodological approach

The rationalisation of the number of facilities involves expenditures on new buildings and alterations to existing buildings, and changes in the annual costs for buildings, equipment and staff. The tasks are to establish the costs for current situation and for the new situation.

The emphasis has been placed on **staff**. The procedure is to identify all staff, by job classification, for the current facilities that are to be amalgamated, and to estimate which of these positions would be lost in the rationalisation. The differences in staff numbers within the various classifications, multiplied by the corresponding labour costs, then give the change in cost.

The required data are complete lists of staff positions and labour costs. It is then a matter of judgement to identify the redundancies in the consolidation, and some of these may be driven by workloads that are currently low. Consolidation would lead to a loss of redundant base manager positions, and there would presumably be some losses in clerical staff.

Low **workloads** might be detected by comparison of consultations per doctor (or other position) across bases. It is possible that even where a RAP has only a fraction of a position, the workload could be below average. A low workload would indicate a situation where consolidation would save costs. Calculation of workload depends on the number of consultations (or consultation hours) and the number of staff. Data for consultations are available from MIMI (except for southern Queensland) and HealthKEYS (for southern Queensland), but are of variable completeness across bases and are also of variable quality. Calculations of workloads indicate gaps in the data. There are also differences between bases in the average time per consultation. The data were not of sufficient quality to identify low workloads.

An alternative approach is to calculate the average number of persons per staff position. This number is complicated slightly if allowance is made for the number of periodic health assessments for permanently employed reservists. Access Economics had access to numbers of ADF personnel for bases, but not always for individual health facilities. Again, the results indicated gaps in the data and were not sufficiently complete to draw conclusions.

Rather than making judgements about redundant staff positions, there is a view that staff number should be determined by the ADF population and the appropriate number of staff (e.g. medical officers) per person. For example, a target of one GP per 600 to 800 persons could be used, compared with around 1 GP per 400 or 500 persons at present and 1 GP per 1,000 persons in the wider community[10], while the US Air Force uses 1 GP per 750 persons. However, this section does not pursue such an approach because it addresses the quantity of health services (see section 6) and expectations about entitlements of service, rather than just workloads and the rationalisation of bases. It is noted that application of a rule of 1 GP per 750 persons to effectively 6,000 ADF personnel in Canberra gives 8 GPs, compared with 11.1 reported in the Cogent review (p. 23).

Refurbishment of buildings arises from the need to re-arrange the interiors of Health Centre buildings, after selected services are moved off base, in order to accommodate the services currently provided in the RAPs and other facilities that would be closed. The average cost of refurbishment is assumed to be $10 million. If insufficient floor space is available, it may be necessary to erect new buildings. It is assumed that office furniture and medical equipment (and dentists' chairs) can be re-used in the consolidated facility. To the extent that it may be time for equipment to be replaced, that should be part of the ongoing program of renewal and not attributable to rationalisation. It is assumed that excess buildings and equipment have no residual value.

Annual operating costs would be reduced by consolidation. It is assumed that facility costs (for utilities, air-conditioning, heating, repair and maintenance (R&M), fire protection, cleaning and waste removal) would be approximately proportional to floor area within each base, although the cost per unit area might vary between regions according to the climate. A value of $57.4/sq m for facility costs was used in evaluating the business case for the operating theatre at RAAF Edinburgh (Area Health Services SA, 2009), although JHC (14 July 2009, Item 5) considered this value to be underestimated. A value of $100/sq m is used in the Access Economics analysis. It is assumed that the average floor area of a RAP is 500 sq m. Costs of communications and office supplies would be approximately proportional to the number of consultations and treatments, but are assumed to be small.

The Grosvenor Report (2006) for the Albury Wodonga Health Centre (AWHC) is a case study that addressed many of the issues covered in this Access Economics report. It examined the costs and risks associated with alternative models for the delivery of health services at the Latchford (Barracks) Health Centre (at Bonegilla) and the smaller South Bandiana RAP that provided only primary health care. Eight options were examined. They covered various combinations of upgrading the facilities and consolidating the two facilities, but also examined provision of hospital beds, operating theatres and outpatient, dental and physiotherapy services off site. They also considered changes in staffing, by consolidating the many individual contracts, or by full dependence on APS health personnel (and none on contractors), and by the possibility of all services being provided by means of a single turnkey contract. The analysis looked not only at costs but placed great emphasis on assessment of risks.

The average number of personnel at the Albury Wodonga bases was around 1,400, where the regular personnel of around 500 were supplemented by many trainees on short term visits. The AWHC results show that consolidation of two centres into one reduced costs by $487,000

[10] According to the 2006 Census, there were 21,647 GPs, servicing a population of 20.57 million people.

but partly offset by shuttle bus costs of $111,000 (option 3 relative to option 2). The cost saving was based on an assumed reduction of 15% in the number of contracted personnel.

The AWHC report found that replacement of the on-site 20-bed hospital and 24-hour on-call service by the use of local hospitals increased costs, although this result depended strongly on the assumption that 10 beds would be required at a cost of $550 a day or $200,000 a year. Annual operating costs increased by $1.27 million, of which $124,000 was accounted for by additional transport costs by shuttle bus (see option 7 relative to option 2). The second Grosvenor Report (2007) used an average of 6.4 beds a day, and the extra annual cost was reduced to $869,000.

While Access Economics is inclined to consolidate all services at each site in a one-stop Central Medical Centre, building costs can be reduced by retaining two facilities. A logical separation is medical and dental. Until electronic record keeping is used widely, it is highly desirable to keep all medical records in one place on a base.

2.3 Canberra

A wide range of health services is currently provided for the ACT at Duntroon Medical Centre. There is primary health care only at Duntroon RAP, HMAS Harman Health Centre and Weston Creek Health Centre. Russell Health Centre has primary health care, dental services, psychological services and a pharmacy. Further details, including staffing, are given in Annex J of the Cogent Review (2009) for the ACT. The number of permanent ADF personnel is around 5,550, but health services are also provided for around 250 foreign personnel. Annual and five-year assessments only are provided for 1,000 or so reservists in permanent employment. There is thus the equivalent of around 6,000 full-time ADF personnel using the health services in Canberra. Cogent gives the dependency as 6,715.

The Cogent Review found that the only long term solution for the future provision of health services in the ACT was the construction of a new purpose-built facility located in the vicinity of Duntroon. It now appears that this will be built in 2011-12, and the analysis assumes that this is the case. The cost would be around $20 million and borne entirely by DSG.

For the shorter term, the Review considered three options that all delivered the same range of services, but differed in the total number of sites and in whether services would be provided on site or off site. Although the shorter term solution has been superseded by the decision to build, it will be described because it addresses most of the changes that are incorporated into the range of services and method of operation for the new building. It also serves as a model for the refurbishments on bases elsewhere. The recommended option is described in Annex I of the Review.

- All services would be consolidated at Duntroon Health Centre which would be refurbished and upgraded.
- Primary health care (scheduled assessments, sick parade, consultations, and specimen collection for pathology) together with allied health services (physiotherapy, rehabilitation, pharmacy, podiatry, dietetic and psychology services) and dental services would continue to be provided on site, although the more difficult cases would be referred outside.
- The existing operating theatre and 28-bed hospital ward would be closed and the corresponding services provided in local hospitals. However, hospitalisation would be

minimised by the introduction of visiting nursing care in homes and barracks for post-surgical patients wherever possible. A new small hostel-type facility near the medical centre would provide overnight care where needed, e.g. to provide appropriate duty of care for young singles.

- All on-site consultations for surgery and for specialist outpatient services would be discontinued and moved off site.
- All on-site x-ray services would be discontinued, which means that all diagnostic services (radiology, imaging, pathology) would be provided off site.

All these recommendations will implemented in the lead up to the new building, except for refurbishment of Duntroon Medical Centre and the erection of a separate hostel-type facility, because it can now be incorporated into the new building. It is assumed that current arrangements for continuing services would be maintained until the new building could be occupied in 2012-13. However, as soon as possible, the operating theatre, x-ray services and on-site specialist consultations would be discontinued, and the inpatient services reduced to low care cases in half the ward. The Centre is at present not 'fit for purpose' because of significant deficiencies, especially in terms of fire safety and electrical safety, but also in terms of the Building Code and air conditioning. Closure of the operating theatre and changing the inpatient ward to low care cases would render the building fit for service although some minor upgrades would be required.

The Cogent Review advises that radiology be outsourced as soon as possible, preferably before expiry of the current contract in January 2010. Savings would commence in 2012-13, after other facilities were closed and all remaining activities were moved to Duntroon.

Inspection of the list of all current medical staff across the ACT (Cogent, Table 13) suggests that savings might consist of 1 dental manager, 3 nurses, 2 dental assistants, 3 clerical officers and 3 other persons, for a total saving of around $845,000 a year using the contract salaries in Table 4.4. It is assumed that all doctors and dentists are working to capacity so that there would be no reduction in their numbers or salaries. This estimate excludes the savings from closure of on-site services and transfer to off-site because these are allowed for in KRM 4 (Section 5). In particular, it does not include savings associated with staff on the inpatient ward. It is noted that a minimum of 4.5 staff are required for full-time operation of even a hostel-type facility, and some additional staff would be required to maintain liaison with hospitals for admissions and for subsequent follow-up by visiting nurses

It is assumed that operating costs for the new building would be approximately the same as for Duntroon Health Centre at present. Closure of other buildings would result in a reduction of around $150,000 in the annual operating costs of buildings.

Consolidation of facilities would increase travel distances and travel times. Persons within walking distance of the new Duntroon Health Centre would be expected to walk, if able, while others might use their own cars or schedule health visits to coincide with other visits. A shuttle bus service would be provided for those not on the Duntroon site and for those at Duntroon who were unable to walk to the Centre. There were 87,500 visits to ACT health centres in 2008 (MIMI data), which corresponds to an average of 350 a day if all visits were on week days (and about 15 visits per person per year). Given the large distances and times between facilities, it is assumed that two shuttle buses would be required. The large demand early in the day for sick parade might be reduced by staggering the time for sick parade. The

Grosvenor Report (2006) for Albury Wodonga used an annual cost of $111,000 for trips between two bases. It is assumed that the annual cost of two shuttle buses is $240,000. Note that additional transport costs associated with moving services off-site are not included in this analysis because they are allowed for in KRM 4 (Section 5).

2.4 Darwin

There are 11 facilities at Robertson Barracks. The Robertson Barracks Medical Centre (RBMC) provides most services, but not dental services. The 1 CSSB RAP provides primary health care plus dental and psychological services. PSSNT (actually at Winnellie and not on the base) provides only psychological support services. The other eight facilities are RAPs that supply only primary health care. There are around 4,100 ADP personnel at the base.

It is assumed that RBMC and 1 CSSB continue operation. It is understood that PSSNT will move to the HMAS Coonawarra Medical Centre. It is assumed that the remaining eight facilities are closed and that their primary health care services, together with those of 1 CSSB, are transferred to RBMC.

It is assumed that the rationalisation at Robertson would replicate that for Canberra, where relevant, by reducing the inpatient accommodation from 22 beds to around 10 beds and closing the x-ray service. These changes, together with some reorganisation of existing rooms (KPMG 2009, p. 14) should go a long way towards providing consulting rooms and examination bays to replace those in the RAPs, and consolidating all medical records at RBMC. If necessary, additional capacity could be achieved by extending opening hours to 12 hours a day, transferring dietician services or some non clinical services to 1 CSSB and, in the last resort, installing demountable buildings.

KPMG has described the benefits of a single hub health facility at Robertson Barracks, while maintaining a separate health company (1 CSSB). It cautions against using any of the RAPs as sub-hubs as part of a transitional process. A planning period of around six months would be needed to gather information about requirements for the hub and to spell out and agree how it would operate. KPMG has addressed in some detail how the existing space could be reorganised to accommodate additional consulting rooms, examination bays, and increased areas for stores, pharmacy, reception and storage of health records. If insufficient space is available, non-clinical / administrative components should be delivered from demountable facilities. Given the many uncertainties, it advises that RAPs be closed in a phased manner so as to evaluate each stage and learn from any shortcomings and problems (KPMG, p. 11).

KPMG has proposed a timeline which starts with a decision to proceed being made in October 2009. Evaluation of data, capacity requirements, reconfiguration plans for buildings and revised operational procedures should be complete by April 2010, at which time building works would commence and new operational procedures would be implemented. An illustrative completion date of April 2011 is given but the actual date would depend on the overall capacity requirements identified and the extent of infrastructure development required. There would then be a phased transfer of RAP functions to RBMC. Some RAPs are not fit for purpose, and these would be moved preferentially, and before completion of refurbishment where possible.

The Access Economics assumptions and arrangements are much the same as for the more detailed KPMG proposal, except for the removal of some beds from the inpatient area. While

KPMG does not commit to estimates of floor spaces and staffing requirements for the new arrangements, such estimates are required for the purposes of the Access Economics analysis. It will be assumed that all functions can be contained within RBMC and 1 CSSB without the need for demountables. Consolidation of staff at RBMC should result in a small reduction in total staff, provided that the pressure to appoint additional managers is resisted and there is no loss of working time through having additional meetings. Staff changes in the inpatient area are not considered here because they are allowed for in KRM4 (Section 5). In the absence of information about workloads, it will be assumed that medical officers are working close to capacity and there would be little saving in numbers. However, it is assumed that there would be a saving of one GP, three nurses, and one other person at each of eight RAPs, for a total annual saving of $1.11 million at contract salaries (see Table 4.4).

Refurbishment costs are assumed to be $10 million, funded equally by DSG and JHC, and annual savings in operating costs for buildings are estimated to be $400,000.

It is anticipated that changes would progress more slowly than suggested by KPMG. For the purposes of illustration it is assumed that costs of refurbishment would be $10 million and be distributed equally between 2010-11 and 2011-12. The RAPs would be closed sequentially at one a quarter commencing in April 2011, only nine months after commencement of refurbishment. Full savings would be achieved in 2013-14.

While personnel would be expected to walk to the health centre, if able, a shuttle bus service would be provided for those who could not, and for those at more distant locations, at an assumed cost of $120,000 a year.

2.5 Brisbane

There appear to be ten active health facilities at Enoggera. The Enoggera Health Centre currently provides a wide range of services, including dental, while the Enoggera Dental Centre provides only dental services. It is assumed that the Health Centre would be retained and the Dental Centre would be closed. The other eight facilities are RAPs that provide only primary health care, and it is assumed that all of them would be closed. There are around 3,704 ADP personnel at the base.

It is proposed that the rationalisation at Enoggera replicates that for Canberra, i.e. close the operating theatre, reduce the inpatient accommodation from 52 beds to around 10 beds, and close the x-ray and pathology services. (There is a view that the operating theatre should be retained for training purposes, but Access Economics considers that such training could be achieved, and with a more representative range of procedures, in local hospitals.) Additional consulting rooms and examination bays would have to be found at the Health Centre to accommodate the displaced RAP consulting rooms and examination bays. This could be achieved by the closure of services and the reduction in the number of beds at the Health Centre, as described above. In addition, all dental services would be consolidated at the Health Centre.

It is assumed that arrangements for the closure of existing services could be made in 2009-10. Closure of 42 beds would provide a lot of floor space for other purposes and, unlike Duntroon, there would be no need for an additional hostel-type building. Refurbishment, commencing with the inpatient area, would occur during 2010-11 and 2011-12, with savings commencing in 2012-13 if not earlier. As suggested in the KPMG Review for Darwin, it would be advisable to

close the RAPs in a phased manner so as to evaluate each stage and learn from any shortcomings and problems.

It is assumed that there would be a staff savings of one GP, three nurses, and one other person at each of eight RAPs, for a total annual saving of $1.11 million at contract salaries (see Table 4.4).

Refurbishment costs are assumed to be $10 million, funded equally by DSG and JHC, and annual savings in operating costs for buildings are estimated to be $440,000.

While personnel would be expected to walk to the health centre, if able, a shuttle bus service would be provided for those who could not, and for those at more distant locations, at an assumed cost of $120,000 a year.

2.6 Townsville

There appear to be nine active facilities at Lavarack Barracks. The Medical Centre provides most services but not dental services, while 3 CSSB has dental services, primary health care, mental health services and Environmental /Preventative Health. The other seven facilities have only primary health care. There are around 4,466 ADF personnel at the base, but this will increase when 3 RAR is transferred to Townsville from Holsworthy.

It is assumed that the Medical Centre and 3 CSSB continue operation. All primary health care would be consolidated at the Medical Centre. It is assumed that the seven minor facilities are closed and that their primary health care services, together with those of 3 CSSB, are transferred to the Medical Centre. All dental services would remain at 3 CSSB, together with the consolidation of all mental health services.

Additional consulting rooms and examination bays would need to be built at the Medical Centre to accommodate the consulting rooms and examination bays currently at the RAPs and 3 CSSB. This space would be generated by reducing the inpatient accommodation from 30 beds to around 10 beds, and closing the x-ray and pathology services. Any shortfall in space might be accommodated by increasing business hours or by the use of a demountable building. It is highly desirable to keep all primary health care and medical records at one site, which means avoiding use of a RAP.

It is assumed that arrangements for the closure of existing services could be made in 2009-10. Refurbishment, commencing with the inpatient area, would occur during 2010-11 and 2011-12, with some savings commencing in 2011-12. As suggested in the KPMG Review for Darwin, it would be advisable to close the RAPs in a phased manner so as to evaluate each stage and learn from any shortcomings and problems.

It is assumed that staff savings would be one GP, three nurses, three receptionists, and one other person at each of seven RAPs, for a total annual saving of $1.24 million at contract salaries (see Table 4.4).

Refurbishment costs are assumed to be $10 million, funded equally by DSG and JHC, and annual savings in operating costs for buildings are estimated to be $350,000.

While personnel would be expected to walk to the health centre, if able, a shuttle bus service would be provided for those who could not, and for those at more distant locations, at an assumed cost of $120,000 a year.

2.7 Other sites

Inspection of the list of all ADF health facilities shows that Canberra and the Army bases in Darwin, Brisbane and Townsville that have been examined provide the greatest opportunities for rationalisation of the number of health facilities. These are followed by the Holsworthy Army base which has five facilities, and then there are groups of two or three bases or facilities that are relatively close together. Of course, rationalisation is not possible for isolated bases.

2.8 Summary of model findings

Estimates of annual net cost savings to JHC from rationalisation of health facilities in Canberra, Darwin, Brisbane and Townsville are summarised in Table 2.1 for the period 2009-10 to 2018-19, together with the component expenditures and savings. Costs and savings are escalated over time according to the health price inflator. (This underestimates energy savings which are likely to increase at a greater rate.) These results are for the rationalisation of the numbers of bases and numbers of facilities within bases. They exclude costs savings obtained from moving services off base. The total net saving for Canberra, Darwin, Brisbane and Townsville over the period is around $19.1 million. Once the rationalisations are complete the annual saving is around $5 million to $6 million a year.

These results are for bases with personnel totalling around 18,000. Given that there are around 50,000 ADF personnel on bases within Australia, it cannot be inferred that total savings across all bases would be 50,000/18,000 of $19.1 million or $53 million. The four sites account for the majority of the savings and it is assumed that the sum of all other rationalisation would increase these results by around 33%. It is expected that the total net cost saving to JHC for Australia is of the order of $25 million, and the annual saving after completion of refurbishment is of the order of $7 million to $8 million.

The results are driven by assumptions and values of key parameters that are considered to be realistic, but for which there is no firm evidence. In this sense the results should be interpreted as illustrative. The major parameters for each location are:

- the costs of refurbishment and major new buildings;
- the annual cost of a shuttle bus service;
- the savings in staff and hence annual labour costs;
- the savings in annual operating costs of buildings; and
- the times at which the changes are implemented and the savings begin.

All the costs and savings are incurred by JHC except for new buildings and R&M, both of which are funded by DSG. (R&M has been omitted from the calculations.) The source of funds for refurbishment is uncertain and subject to negotiation. It has been assumed that JHC provides half the funds, on average, for the refurbishments considered in this analysis. Access Economics finds that the most important assumptions are the savings in staff, followed by the amount of funds for refurbishment provided by JHC. In the absence of reliable data about workloads or familiarity with procedures at RAPs, the savings in staff are subjective.

In the worst case, a halving of staff savings would reduce the net result out to 2018-19 by $22 million, while there could be an additional cost to JHC of up to $20 million ($15 million plus 33%) for refurbishment. Such a combination is highly unlikely. On the other hand, there is the possibility of savings being greater by the same amounts.

It has been assumed that refurbishment of central health centres in Army facilities would commence in successive years at Brisbane, Townville and Darwin, and extend over two years because of the need to maintain services during the changes. It is then assumed that services are transferred sequentially at quarterly intervals from RAPs to central facilities. The timing of the rationalisation process is subject to considerable uncertainties about the times required to reach agreement to proceed and to obtain funding. The production of detailed plans, the letting of contracts and the time for construction are more predictable, but also subject to variation. There are circumstances under which the assumed time table could be either brought forward or delayed.

The Grosvenor Report (2007) extended the methodology used for the Albury Wodonga Health Centre to all bases in Australia and to additional options. It found that the annual saving from 're-engineered delivery' which comprised 'refurbishing existing facilities, re-engineering current processes and resource allocation, and consolidating existing contracts by service' was $12.4 million (option 2 relative to option 1, the base case), based on an assumed reduction of 15% in the number of contracted personnel. There was a one-off transition cost of $17.6 million but capital costs of refurbishment were not included.

The additional annual saving from rationalisation of bases within close proximity of one another was $12.4 million (option 3 relative to option 2), based on an assumed additional reduction of 15% in the number of contracted personnel. Capital costs of refurbishment were not included. The time for implementation was estimated at 4 to 24 years.

The Access Economics calculations correspond to the Grosvenor rationalisation plus part of the Grosvenor re-engineering. The annual savings in Table 2.1 are lower than the Grosvenor savings, and a major reason for this is that the Grosvenor rationalisation calculations are based on a reduction of 30% in the number of contracted personnel, which seems excessive.

Table 2.1: JHC budget impact of rationalisation of the number of facilities (nominal $)

Description	09-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	Total
Canberra											
New expenditures			0.0	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-2.1
Savings				1.1	1.2	1.2	1.2	1.3	1.3	1.3	8.5
Net savings Canberra			**0.0**	**0.9**	**0.9**	**0.9**	**0.9**	**0.9**	**1.0**	**1.0**	**6.5**
Darwin											
New expenditures				-2.5	-2.6	-0.1	-0.1	-0.2	-0.2	-0.2	-5.9
Savings				0.0	0.6	1.3	1.6	1.6	1.7	1.7	8.6
Net savings Darwin		**0.0**	**0.0**	**-2.5**	**-2.0**	**1.2**	**1.5**	**1.5**	**1.5**	**1.6**	**2.7**
Brisbane											
New expenditures		-2.5	-2.6	-0.1	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2	-6.2
Savings			0.4	1.1	1.6	1.6	1.6	1.7	1.7	1.8	11.6
Net savings Brisbane		**-2.5**	**-2.3**	**1.0**	**1.4**	**1.5**	**1.5**	**1.5**	**1.6**	**1.6**	**5.4**
Townsville											
New expenditures			-2.5	-2.6	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2	-6.0
Savings				0.4	1.2	1.7	1.7	1.8	1.8	1.9	10.5
Net savings Townsville		**0.0**	**-2.5**	**-2.2**	**1.1**	**1.5**	**1.6**	**1.6**	**1.7**	**1.7**	**4.5**
Canberra+Darwin+Brisbane+Townsville											
New expenditures		-2.5	-5.1	-5.5	-3.2	-0.7	-0.7	-0.8	-0.8	-0.8	-20.1
Savings		0.0	0.4	2.7	4.5	5.8	6.2	6.4	6.6	6.8	39.3
Net savings for the above four sites		-2.5	-4.8	-2.8	1.3	5.0	5.5	5.6	5.8	6.0	19.1
Net savings for other bases		-0.8	-1.6	-0.9	0.4	1.7	1.8	1.9	1.9	2.0	6.4
Total net savings - facilities rationalisation		**-3.3**	**-6.3**	**-3.8**	**1.8**	**6.7**	**7.3**	**7.5**	**7.7**	**7.9**	**25.5**

Source: Access Economics. Note: Includes capital and recurrent expenditure items.

2.9 Key risks – proposed facilities rationalisation

Risks identified by JHC in relation to the integrated health workforce KRM were as follows.

- Availability of Major Capital Funding to fund new facilities and timeline to rebuild
- Any demountable solution beyond $5 million requires Public Works Committee (PWC) approval
- Demountable solutions have a six year life, before requiring major refurbishment
- Any permanent capital works beyond $20 million requires PWC approval
- Resistance from Services to a changed health delivery model

These risks relate to funding and the possibility of deferment and delays. It is assumed that changes described in the preceding sections will occur, without major compromise, but it is recognised that resistance to change by Services may result in delays.

The model findings summarised in the previous section use best estimates of the underlying parameters. In particular, it is assumed that JHC provides $15 million (or 50%) of the cost of refurbishments. The risk analysis in Section 9.2 allows for variation in the amount of the JHC contribution to refurbishment, and higher and lower savings from reductions in the number of staff at medical facilities, excluding savings arising from transfer of services from on base to off base. Variations in the costs of shuttle buses and in savings from reduced total operating costs for buildings are both relatively small and are not included in the risk analysis.

While earlier and later dates for refurbishment, and hence the commencement of savings, are of interest, they are not included in the risk analysis because of the large uncertainties. The timing is driven more by Services reaching agreement with the JHC plan than by technical issues. Also, achieving the full benefits of the plan will depend on the level of cooperation in implementing the changes within bases. Delays would reduce the total savings through to 2018-19 but would still increase the annual savings, once the changes were in place.

3 Introduction of the Joint eHealth Data and Information (JEHDI) system

For the last two decades, although hopes for e-health to revolutionise Australian healthcare have been high and while virtually every other sector of the economy has been fully computerised, many health care professionals and administrators still work with pen and paper. This economy-wide picture has been mirrored in Defence. The past 20 years have seen two long-term efforts at Defence e-health falter, and although some Defence health records have also been captured in various electronic formats, paper remains the fundamental core of the system.

A third initiative, JEHDI, is about to begin, but is still very much in the early prototype stages. This makes evaluation of its potential benefits problematic. As the European Commission (2006) notes, even long-lived and wide-spread established e-health systems have proved difficult to evaluate in economic terms.

3.1 A short history of Defence e-health

In 1989, the Defence Regional Support Review identified the need to centralise and computerise ADF health records. Today, 70% of defence health records are solely paper-based, and those that are computerised are split between a number of systems that do not communicate well with each other, if at all (Department of Defence, 2009b).

3.1.1 Phase 1: Health Systems Redevelopment Project (1989-1999)

In 1990, Defence began the Health Systems Redevelopment Project (HSRP), based on a 'commercial off the shelf' software package. The Audit Office (1997) stated that it was 'concerned about the length of time the project has taken - it has been under development for seven years, and has yet to be implemented'. The ANAO also noted that the HSRP and systems for OHS and pharmaceutical management had been developed in isolation from each other, and could not interface with each other. The HSRP was subsequently abandoned due to cost, consultation issues, internal module inconsistency and steep learning curves.

- The ANAO also noted that the Albury-Wodonga Medical Centre had developed a computerised system that saved 60% on the costs of the previous paper-based admissions system. As the majority of defence health records are still paper-based, similar savings may be still be achievable in some health centres.

3.1.2 Phase 2: HealthKEYS, MIMI and other systems (1999-2009)

In 1999, a new project HealthKEYS was introduced, based on an updated version of HSRP software, MAXCARE. HealthKEYS was originally expected to cost $8.5 million, to be phased in over five years, and thence to generate ongoing savings of $7.3 million per annum. By 2002, HealthKEYS was planned to have been adopted by 175 health centres.

However, by the beginning of 2004, HealthKEYS had only been adopted by four sites[11]. By 2005 it was apparent that HealthKEYS had low acceptance by user clinicians, lacked suitable hardware, and suffered from performance issues such as its Citrix server crashing (Booz and Co, 2008). In 2006 Defence commissioned a review, which recommended that the project be paused, and transferred from JHC to the Chief Information Officer Group (CIOG). CIOG then commissioned its own review and concluded that 'MAXCARE software is at the end of life and is not sustainable within the Defence environment. A replacement product should be sought' (Booz and Co, 2008).

In the meantime, an independent, bottom-up system had started to proliferate through health centres. The Medical Information Management Index (MIMI) was a Microsoft Access database developed by the Balmoral Naval Hospital in Sydney for its own resource management. MIMI is now in use by around 125 sites, in all areas except Southern Queensland (which uses HealthKEYS).

However, like HealthKEYS, MIMI suffers from a number of core shortcomings, including data quality, lack of coverage, inability to transfer information between locations and lack of an individual electronic health record. It is also still only supported by one programmer based in Sydney.

In addition to HealthKEYS and MIMI, there are a number of other smaller, localised e-health systems across defence:

- EPI-Track, an Access database designed to capture epidemiological morbidity data;
- the Micro Imaging RAAF Medical Records (MIRMER), which scans paper medical records for the Air Force;
- the Pharmaceutical Integrated Logistics System (PILS), a pharmacy system used by health centres (but only those which have a pharmacist);
- the Electronic Psychology Record and Information System (EPRIS) a web-based psychological application;
- and the Occupational Health and Safety Management Information System (OHSMIS) which is currently under development.

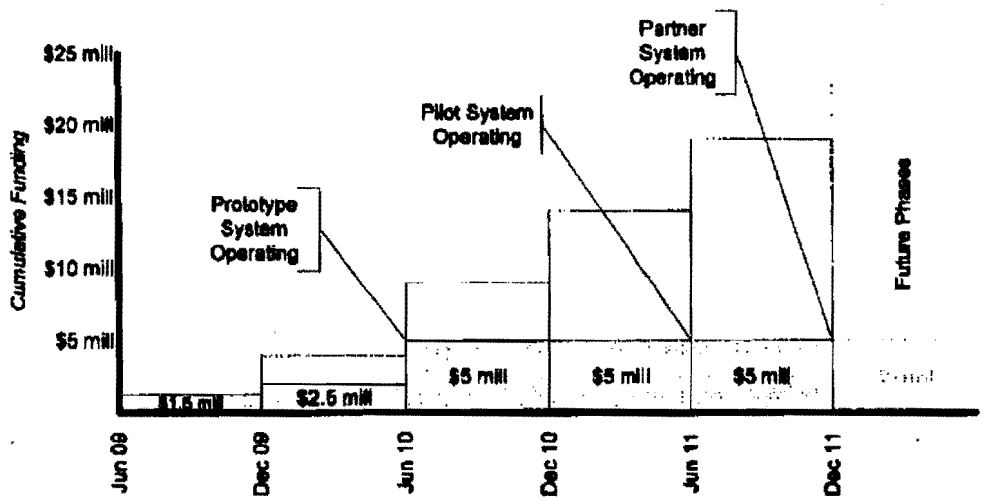
3.1.3 Phase 3: JEHDI (2009-)

In 2008 the Chiefs of Service Committee directed CIOG to investigate commercial-off-the-shelf eHealth products to provide a fast track interim solution to the lack of a comprehensive health information system (Department of Defence, 2009b). CIOG concluded that current capability could not be built upon, and that a 'clean start' was required. This was the commencement of JEHDI.

The initial budget is $20 million (Figure 3.1), with complete development and roll-out costs expected to be in the vicinity of $50 million. JEHDI is expected to have a replacement for HealthKEYS and MIMI up and running by around 2012-13 (Figure 3.2).

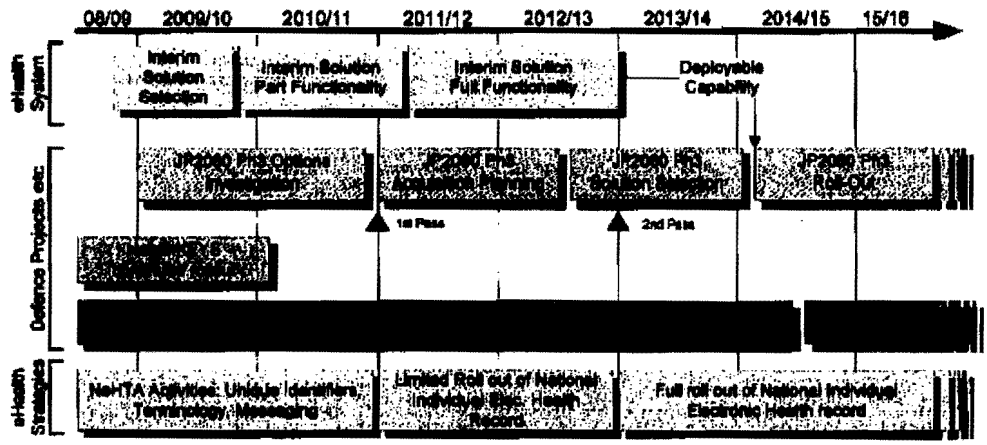
[11] It has since expanded to around 30 sites.

Figure 3.1: Initial development of JEHDI



Source: JHC.

Figure 3.2: Relationships between JEHDI and other e-health systems



Notes: JEHDI is labelled 'e-health solution' in the chart. JP2060 is a deployable (as opposed to garrison) Defence e-health project. The bottom row refers to nation-wide civil e-health strategies.
Source: Department of Defence (2009b)

So far, a project manager has been engaged, and an initial proof-of-concept conducted by CIOG. CIOG (Department of Defence, 2009) reported that:

- the proof of concept demonstrated that it is possible to develop an eHealth system with the required capability and functionality by integrating commercial off the shelf software products;

- the system can be accessible via the internet, by any user with the appropriate access rights, from any location where internet services exist;[12] and
- feedback from the users was 'overwhelmingly positive' regarding the functionality of the system and the preliminary interface.

3.2 Potential benefits from e-health

E-health systems have been in place in some countries since the early 1990s. For example, Denmark has had a national e-health system, MedCom, since 1994. MedCom covers GPs, pharmacists, diagnostic services, specialists, hospitals and transfer from hospitals to home care or residential care services. The European Commission (2006) describes MedCom as a successful example of cooperation between the healthcare, community and social welfare sectors.

Operating since 1997, the US Department of Veterans Affairs electronic health record, VistA, is one of the most widely used and proven electronic health records in the world, supporting treatment for 5-6 million patients every year. VistA includes electronic prescriptions, medication administration, clinical guidelines and physician decision support. VistA also enables a doctor, nurse or other health care provider to update a patient's history, place orders, review tests and enter new data from a visit or a procedure. All of this information is available to the community of health providers in acute settings, clinics, exam rooms, nursing stations and offices. Veterans are also able to access their health records over the internet.

- VistA also demonstrates that successful e-health systems do not need to always be based on the latest cutting-edge technology – it is built on a programming language written in the 1960s.

However, even with successful, long-established e-health systems, the European Commission (2006) notes while the impacts are 'potentially enormous', they have been difficult to measure, with the result that 'little reliable evidence is available on the economic impact of using ICT in delivering high quality healthcare'. The Commission also notes that while e-health expenditure is beginning to rival medical devices, unlike the latter, e-health applications are not yet routinely assessed for their impacts, benefits and safety.

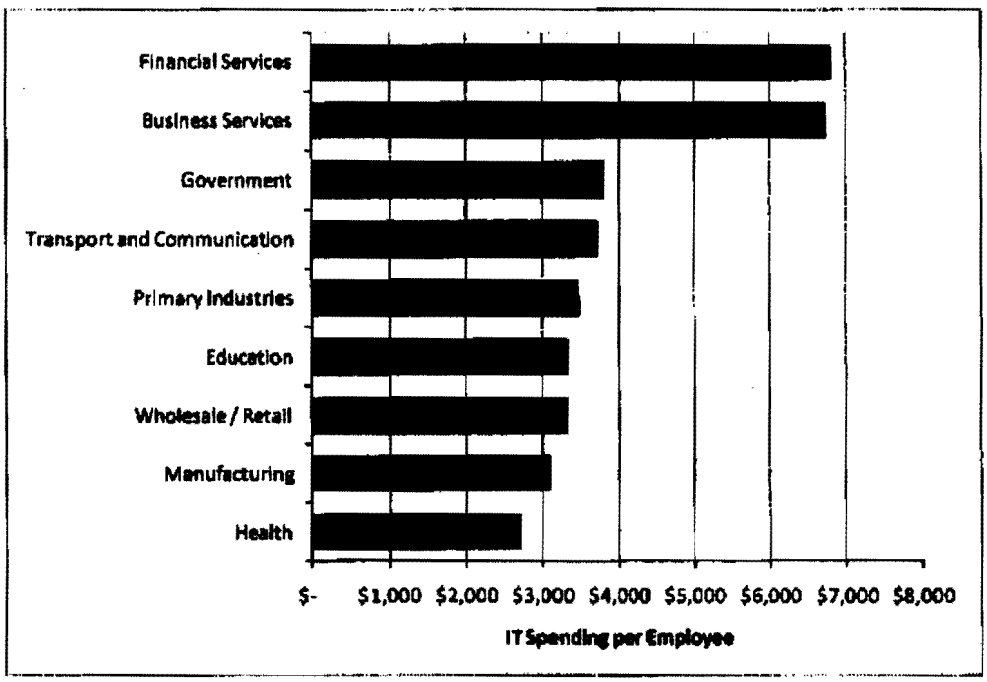
Given the difficulty evaluating the costs and benefits of established e-health systems, it is manifestly more difficult to accurately estimate the benefits of an as yet unspecified system such as JEHDI. While the Commission found that all the sites it evaluated had large net benefits, it cautioned against inferring similar results for proposed systems. For example, the 10 evaluated systems are all unrepresentative in that they were successfully established, so using them for cost benefit analysis may overstate benefits of potentially lesser systems.

Defence is far from alone in failing to successfully implement e-health systems. *The Economist* (2009) notes that as far back as the 1960s, Kaiser Permanente funded the first e-health conferences 'convinced that this was the future—only to see one effort after another fail over the next 40 years'. In the same article, Vantage Point, a large American venture-capital fund, noted that its backing of e-health initiatives had 'tried and failed repeatedly over the past 20 years'. Similarly, in the UK, the NHS has spent £13 billion digitising England's health system,

[12] Around 70% of Defence health services are supplied by civilians who do not have clearance to use the Defence Restricted Network (which HealthKEYS was part of).

but is at least four years behind schedule, and a recent parliamentary report concluded that costs may continue to soar (United Kingdom, 2009). For such reasons, the degree of computerisation of health remains well below most sectors of the economy (Chart 3.1).

Chart 3.1: IT spending per employee, North America, 2007 ($'000)



Source: Info-Tech Research Group (2007).

Booz & Co. (2008) note that the main reason for the failure of e-health systems is not hardware or software, but organisational dynamics (or lack thereof):

> *Very few e-Health programs have failed because of the technology. Most have run into major challenges around people (for example not articulating the stakeholder value propositions or capacity constraints), process (for example understanding the impact of decisions on real-life activities and processes), physical infrastructure (for example finding innovative approaches to fund enabling infrastructure) and frequently not being able to justify the case for change and path to benefit realisation.*

Similarly, the European Commission (2006) cautions:

> *The ICT component of eHealth can be transferred and adapted to other settings, albeit with some technical effort and modifications. However, replicating the ICT solution alone will not be enough. The organisational components of eHealth, such as changing work processes and creating and sustaining multi-disciplinary team working, cannot be transferred so easily, but will depend on the pace at which the organisation can learn and adapt.*

- Indeed, one organisational capacity that the European Commission considered crucial was the ability to examine, and learn from, past failures. Access Economics is not aware of any formal analysis into the (non-technical) causes behind HSRP and HealthKEYS lack of success, although this may well exist.

Bearing the above qualifications in mind, there are some salient lessons from the Commission's study that may be applicable to JEHDI (assuming it is successfully implemented). The first is patience. The average time taken by the 10 large schemes examined to recover set-up costs was five years. The e-health system that appears closest to JEHDI, the Czech Republic's national web-based electronic health record (IZIP), took eight years to turn a net benefit.

- This may limit the ability of JEHDI to achieve budget savings within the specified time frame of the DMFP.

Second, most of the benefits achieved were increases in efficiency rather than effectiveness. Decreases in unit costs accounted for the majority of benefits, but the study could not substantiate improvements in health outcomes in terms of QALYs. (This is not to say such benefits do not exist, but that the data necessary to establish them do not.)

Third, and partly-related, the majority of benefits are captured by health providers (in this case JHC) rather than by patients.

Examples of cost saving that *may* be applicable to JEHDI include:

- decreased costs of pharmaceutical prescriptions (58%);
- decreased administrative costs from electronic records (74%);
- decreased costs per vaccination (41%);
- decreased logistics costs (9%)
- savings per inquiry using online rather than call-centre (85%)[13]; and
- decreased costs per scan, using teleradiology (34%).

Similarly, RAND Health (2005) reports on savings found from existing e-health systems in the US. The RAND report usually has up to three observations for each type of saving, as opposed to only one for the European Commission. Conversely, the Commission conducted an in-depth evaluation of all its sites using a consistent methodology, whereas RAND simply report the findings of individual studies from a literature trawl.

[13] Possibly relevant to 1800 IMSICK.

Table 3.1: Illustrative e-health savings from literature

Service	Saving
Drug expenditure (Inpatient)	15.2%
Drug expenditures (Outpatient)	15.0%
Imaging (Outpatient)	14.0%
Laboratory tests (Inpatient)	11.8%
Laboratory tests (Outpatient)	22.4%
Medical records administration (Inpatient)*	50.0%
Medical records administration (Outpatient)	63.4%
Nurse time (Inpatient)	11.4%
Patient length of stay (Inpatient)	15.2%
Transcription (Outpatient)	73.5%

Note: * not derived from published literature, but from discussion with hospital executives
Source: RAND (2005).

Another potential source of benefit from e-health is improved health outcomes from fewer adverse events. For example, Amarasingham et al (2009) compared a group of hospitals in Texas that has adopted advanced health IT systems with a group that has not, and found that the first group suffered 15% fewer deaths and 16% fewer complications, as well as enjoying lower costs. However, and perhaps ironically, the scope for savings here from JEHDI may be limited. While Defence is still primarily a paper based health system, it is a world-class paper system. All records are centrally housed, as well as having copies that follow personnel via a secure transfer system.

Eventually, JEHDI may allow data mining that will improve long-term health outcomes. However, such benefits are likely to accrue to personnel after they have left the ADF (and thus be reaped by DVA rather than JHC)[14]. As the Organisation for Economic Cooperation and Development (2005) observes 'technological improvements that enhance effectiveness are not necessarily accompanied by cost savings in health budgets'.

In summary, Access Economics believes that JEHDI has considerable potential to reduce costs and to improve health outcomes for ADF personnel, but does not consider that it is realistic to attempt to quantify either benefits or costs at such an early prototype stage of development, or in this SRP timeframe. Given Defence's previous track record with IT projects – not just in health – it is reasonably likely that JEHDI's costs will multiply. However, overall, Access Economics' view is that JEHDI's contribution to budget savings is likely to be neutral or slightly positive over the DMFP. A great deal depends on the skill of the Project Manager in ensuring that lessons from past and overseas experience are incorporated in planning and design such that JEHDI has the maximum chance of success and efficiency.

[14] In fact, the main tangible benefit from JEHDI may be reduced search costs for DVA upon member transfer.

4 Integrated health workforce

GPs are among the most expensive, and most numerous, of all the components of the Defence health workforce. Accordingly, they account for a substantial part of workforce costs. There would appear to be substantial scope for savings in GP employment. The most expensive way to employ a GP is as a contractor, ADF physicians are substantially cheaper, and APS doctors less expensive again. Yet, nearly two-thirds of the (permanent)[15] GP workforce are employed as contractors, with most of the rest as ADF, and few, if any, as APS.

This chapter examines whether it is in fact feasible to employ GPs as APS, or whether their private sector pay scales are just too high to make APS remuneration worth considering. Having examined the considerable variation in GP salaries by age, location and gender, the chapter then assesses who, and how many, GPs could be interested in APS positions if advertised. A similar salary versus security trade-off is employed to assess potential savings from substituting contractors for APS positions for other types of health worker.

One of the issues Defence faces in retaining ADF GPs is the lack of challenge. The ADF is full of fit, healthy young men and women who mostly do not require complex case management. In the US, there are two classes of non-physician clinicians, Nurse Practitioners and Physician Assistants, who can carry out most of the functions of a GP, at a fraction of the wage cost. These 'physician extenders' would appear to be well suited to deal with the majority of Defence primary care requirements. The second half of the chapter examines the potential savings from employing them in Australian Defence health.

4.1 Current workforce composition

JHC provided Access Economics with lists of all contractors (Table 4.1) and APS employees (Table 4.2) currently working in health centres (not including national headquarters). Dunt (2009) provides a list of ADF health personnel (Table 4.3). (Dunt's list only includes personnel who could potentially be drawn upon to provide mental health services, Access Economics has included others where they are known, but there may still be some missing.) In total, this provides an estimate of 4,054 persons available in various capacities to supply defence health services.

[15] Not including reservists, who mostly appear to be only called upon for deployment, rather than garrison health.

Table 4.1: Defence health contractors, 2009

Category	No.
General Practitioner	227
RN Div 1	161
RN Div 2 Enrolled Nurse	85
Dental Assistant	77
Physiotherapist	69
Dentist	54
Pharmacist	31
Nurse Unit Manager	25
Medical Clerk	22
Dental Hygienist	17
Other	115
Total	**883**

Source: JHC.

Dunt (2009) contains a recent and comprehensive list of personnel who could potentially be available to meet mental health needs (Table 4.3).

Table 4.2: APS employees

APS Level	1	2	3	3/4	4	4/5	5	6	EL1	EL2	Other	Total
(RN)							1					1
Admin	8	71	19		11		3	1				113
BM								1				1
Finance					1							1
General Service	6	2										8
Health Services Staff Officer											1	1
HSM								1				1
Logistics Driver		3										3
Physio							15	1	1			17
Professional						15		20	3	1		39
Resource Manager					1							1
Technical				7								7
Unspecified		16	2		1		1	2				22
Total	14	92	21	7	14	15	20	26	4	1	1	215

Source: JHC

Table 4.3: ADF health personnel

	Regular	Reserve	Total
Specialists		101	101
Medical Officers	136	302	438
Psychiatrists	0	13	13
Nursing Officers	237	320	557
Alcohol, Tobacco and Other Drugs Program	14	0	14
Psychologists	77	128	233
Psychological Examiners	57	34	91
Medics, Medical Assistants and other related	952	271	1,223
Physical Training Instructors	282	32	314
Total	**1,755**	**1,201**	**2,956**

Note: Based on Dunt (2009) which only included personal considered potentially available by mental health, reserve medical specialists have been included by Access Economics, but there may be others that should also be included.
Source: Dunt (2009).

4.2 GP and other contractor conversion potential

There are many positions in Defence Health which are currently filled by professional services providers (PSPs) or contractors, but which could be filled by APS personnel. Generally speaking, contractors require higher remuneration than permanent employees, to compensate them for the uncertainty of that income. Thus, if JHC were able to convert some of these positions from PSPs to APS, potentially significant savings could be achieved.

JHC has identified a further 304 positions that are currently filled by contractors, but which are potentially suitable for conversion to APS positions (Table 4.4).

Table 4.4: Contract positions potentially convertible to APS

	ACT	Adelaide	Brisbane	Cairns	Canberra	Crib Point	Darwin	East Sale	Ipswich	Melbourne	Nowra	Orbey	Perth	Richmond	Singleton	Sydney	Toowoomba	Townsville	Wagga	Williamtown	Total
Dental Assistant	8	2	3			6	2		6	4	2					15		6	3	2	59
Exercise Therapist			1																1		2
General Practitioner	5	2	5	1		3	4	1	2	1	2	1	3	1	1	13	1	5	2	1	58
Medical Clerk	2					5				2			1					10	1		21
Nurse Unit Manager			2		1		1	1			1		1			2			2	1	12
Physiotherapist	8	1	3	1		1	10	1	4	1	1	1		1	2	7		1	4	1	46
Psychologist			1												1	1					3
Quality Manager			1				1														2
Registered Nurse	6	1	6	1			7		2	2	1	1	3	1	1	10	1	5	3	2	63
Enrolled Nurse	3	6	3	1		1	3		3	4			1	2	2	6		1	5	2	43
Storeperson / driver						1				1						1					3
Total	33	12	28	4	1	17	28	3	17	18	7	3	9	5	7	65	2	28	21	9	304

Source: JHC.

Most of these identified positions pay substantially better than APS rates (Table 4.5)

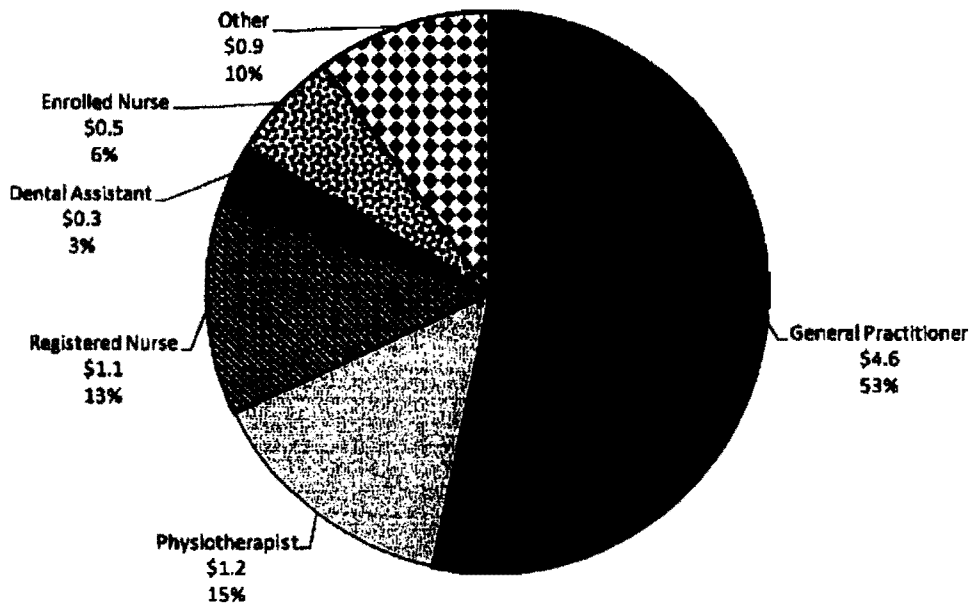
Table 4.5: Average remuneration and costs by employment type ($ '000 per year)

	Contract salary	APS salary	APS cost to JHC	Conversion Savings
Storeman / Driver	59.7	47.5	57.8	2.0
Dental Assistant	62.4	47.5	57.8	4.6
Medical Clerk	64.1	48.0	58.4	5.7
RN Div 2 Enrolled Nurse	71.8	48.7	59.2	12.6
Exercise Therapist	97.4	74.0	90.0	7.4
RN Div 1	100.5	66.0	80.5	20.0
Quality Manager	110.9	74.0	90.0	20.9
Physiotherapist	118.4	76.1	92.5	25.9
Nurse Unit Manager	134.2	83.0	101.0	33.2
Psychologist	233.8	116.0	141.0	92.8
GP	296.5	162.4	218.0	78.5

Source: JHC.

If all of these positions were to be converted to APS, JHC would realise savings of $8.5 million per annum. Due to their large numbers and generous remuneration, the majority of these potential savings (52%) could be achieved through rationalisation of GP positions (Chart 4.1).

Chart 4.1: Distribution of potential savings from contractor conversion ($ million)



Source: JHC.

4.2.2 Range of private sector to APS remuneration for GPs

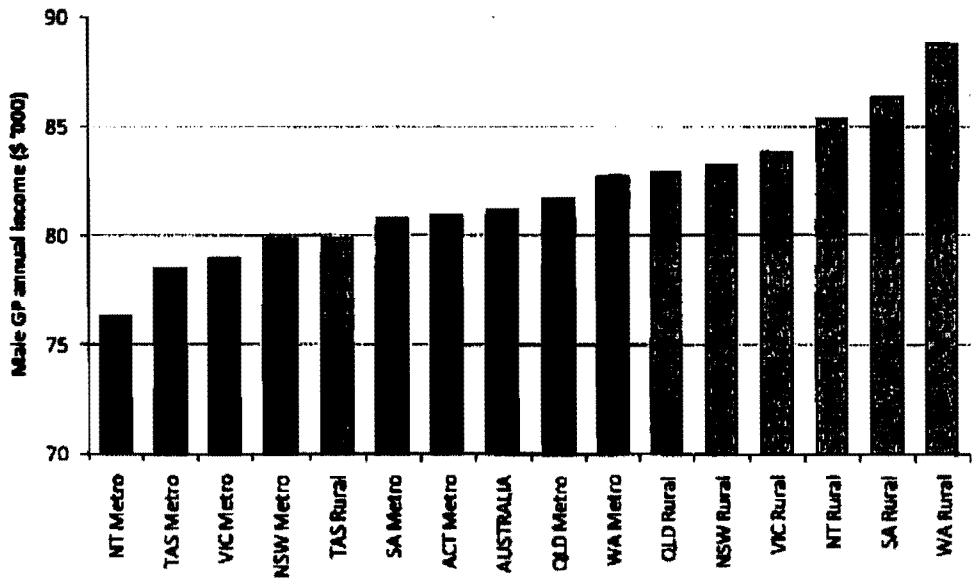
From the available data, it would appear that there may be no APS doctors working for JHC. However, while the average contract doctor is paid considerably more than an APS wage, Access Economics considers that there would be a sufficient number of doctors interested in working under APS conditions.

According to Melbourne University (2009), the average doctor earns $3,584 a week. Multiplying this by the average of 48.5 weeks per year (Access Economics, 2001) yields an average salary of $170,381 p.a. This is close to the average salary for an APS doctor (Medical Officer Class 4) of $162,366. Yet, on average, JHC pays contract GPs $296,489 a year – or more than twice the average civilian salary.

Even if doctors significantly understated their income in surveys, and JHC contract rates reflected market averages, there is still significant variation in GP incomes based on ABS and AIHW data. This could afford JHC the opportunity to 'cherry pick' doctors with lower incomes / working hours. Regions with lower GP incomes, and female GPs may be more amenable to APS salaries (Chart 4.2 and Chart 4.3). (Note these data are lower in absolute terms as they are not full time, but are included to illustrate dispersion.)

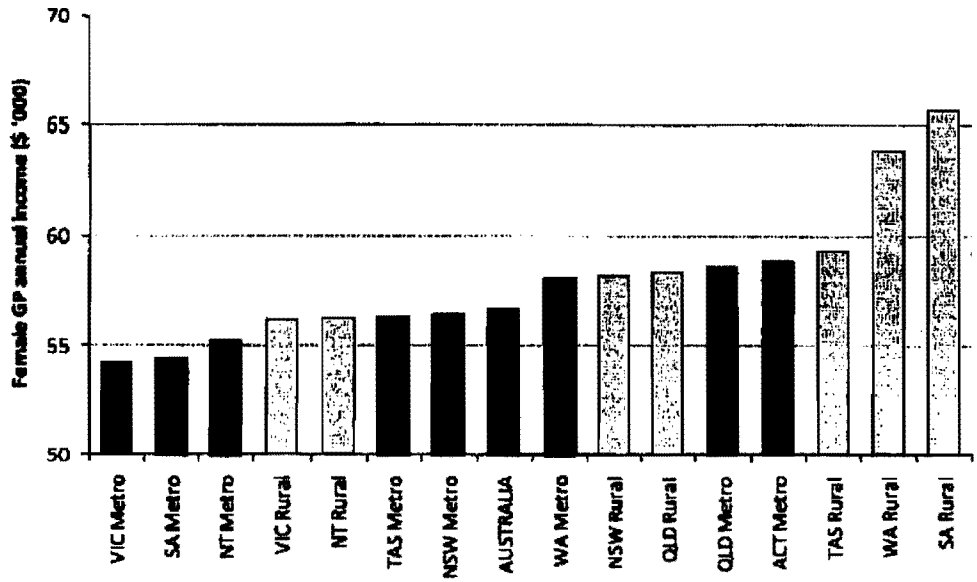
Access Economics (2001) reported similar variation in GP incomes by age (Chart 4.4) so younger doctors may be more recruitable.

Chart 4.2: Male GP incomes, by region and gender, 2006



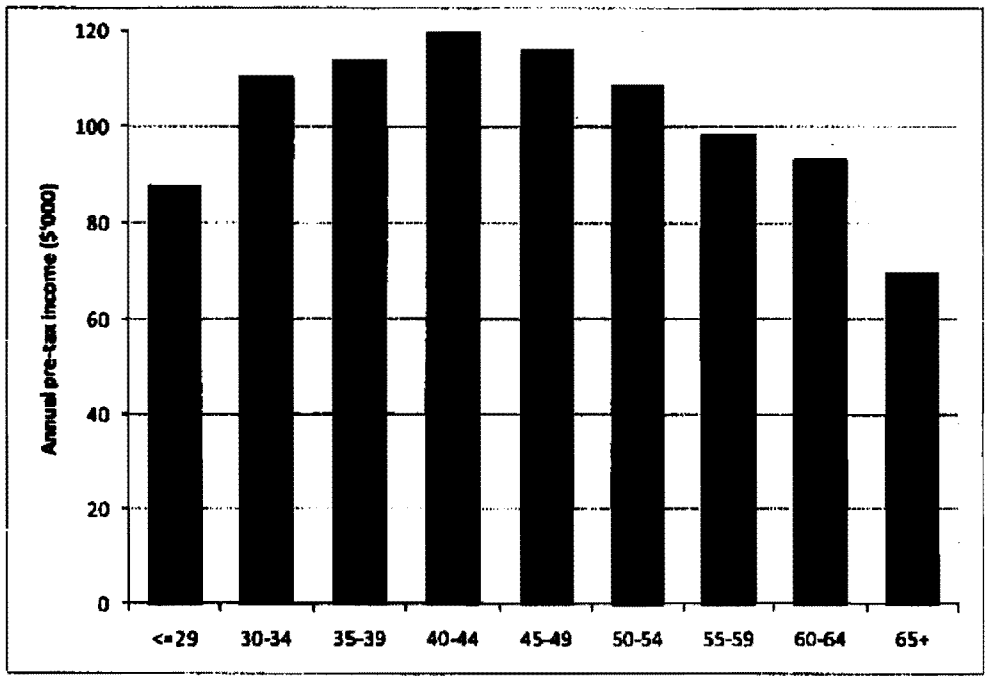
Source: ABS Census data online, AIHW (2008)
Note: annual income =weekly earnings (Census), multiplied by weeks worked in 2006 (AIHW)

Chart 4.3: Female GP incomes, by region and gender, 2006



Source: ABS Census data online, AIHW (2008).

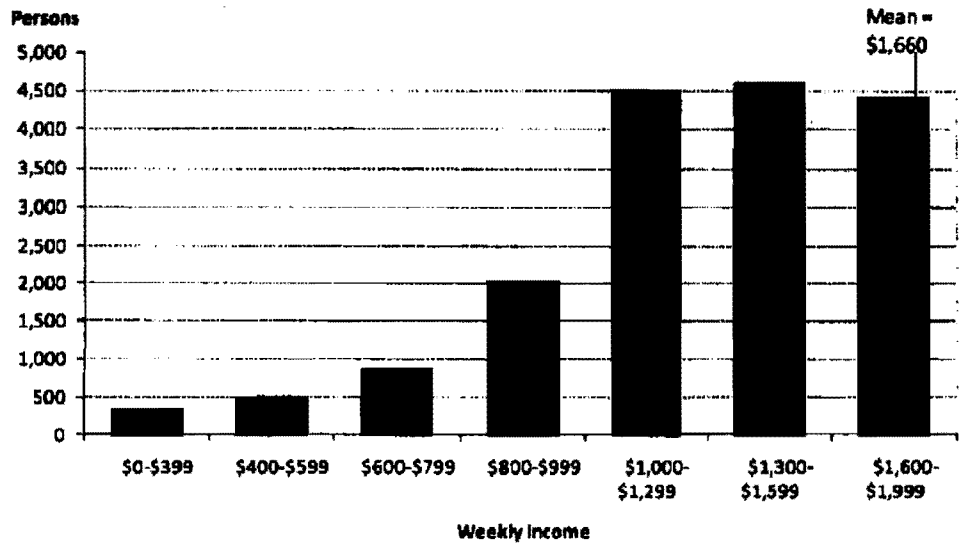
Chart 4.4: Distribution of male GP income, by age, 2001



Source: Access Economics (2001).

Overall, there are a substantial proportion of GPs earning well below the mean (Chart 4.5).

Chart 4.5: Distribution of GP weekly income (2006)



Given there are some 55,000 doctors in Australia of whom roughly half are GPs, there should at least be some who could find APS remuneration and conditions attractive.

Also, most doctors would like to reduce their working hours (University of Melbourne, 2009). Some of these doctors may be interested in APS positions – given low base dependency ratios, they could work fewer hours and still have a relatively good income.

Thus, the fact that many of these positions are currently filled by contractors should not be taken as evidence that JHC was unable to attract people at APS rates. The Secretary of Defence (Department of Defence, 2009) recently stated that, because of previous ceilings on public service employment, Defence as a whole now has 57% more contractors than it requires.

- This appears to contravene the Australian Public Service Act (1999) which states that public servants – not contractors - are to be employed for long term positions.
- JHC has had some earlier success in converting contractor positions.

4.2.3 Wage –security trade offs

It has long been observed in economics that in the labour market there is a degree of trade-off between job security and wages. During periods of recession - and thus low job security - workers are less strident in pursuing wage increases. This underlies the policy dilemma faced by governments when they have to choose between higher unemployment or higher inflation (Phillips, 1958). This trade off between security and salary has been found to be reasonably consistent for both wage levels and growth rates, for objective and subjective measures of insecurity, and across countries and times (e.g. Aaronson and Sullivan, 1998 and Hubler and Hubler, 2006)

In the Australian context, Kelly et al (1998) in a survey covering 14,453 people, found that workers would require a 40% wage increase to perform the same job as a casual than as a permanent employee. This is consistent with the statement by the Secretary of Defence (Department of Defence, 2009) that, across Defence, contractors cost 40% more than civilians.

Thus, for the purposes of this analysis, it is assumed that for contract positions paying less than 40% above APS rates, the contractor (or another suitably qualified person elsewhere in the private sector) would be indifferent between their current lucrative but risky position, and a lower paid but secure APS position.

In total there are 232, out of the 304 convertible positions, that pay less than 40% above APS rates. If all these were converted, this would represent savings of $4.8 million per year[16]. In 2003 Operation Bluegum identified a similar number (200) of pharmaceutical, physio, administrative and clerical positions that were filled within Defence Health on a contract basis, but which were more appropriately APS. The outcome of this exercise was to achieve a broadly similar level of savings of $3 million per annum for JHC (Department of Defence, 2007).

[16] Measured against actual positions. In some lower-skill positions the contract price currently represents less than APS employment costs. These positions would not be considered for conversion.

Table 4.6: Savings achievable by converting actual contract positions that pay less than 40%

Category	Positions	Average saving ($ pa)	Max savings ($ '000 pa)
GP	41	52,919	2,170
Registered Nurse	41	18,130	743
Physiotherapist	38	19,123	727
Enrolled Nurse	37	10,935	405
Nurse Manager	11	32,241	355
Dental Assistant	38	7,826	297
Medical Clerk	20	4,346	87
Quality Manager	2	20,864	42
Psychologist	1	33,117	33
Exercise Therapist	2	7,389	15
Storeman	1	7,589	8
Total	**232**		**4,880**

Source: JHC.

As a base case, it is assumed that after all these positions have been advertised as APS vacancies, two-thirds will eventually be filled. This would achieve savings of around $3.5 million a year – broadly compatible with those from Operation Bluegum. (Operation Bluegum targeted lower paid workers, which would have reduced its potential savings.)

- Operation Bluegum targeted the conversion of 201 contractor positions and actually converted 170 to APS.
- Sensitivity analysis will be conducted on higher and lower salary vs. security trade-offs, and longer and shorter phase in periods.
- While there will be some private sector workers who earn less than 40% above APS rates who are not tempted by the security, equally there will be some who earn more than this, but are attracted to the security and /or lower dependencies. Equally, while bases in rural locations may have trouble recruiting from a scarce pool of health workers, positions in metro locations maybe seen as highly attractive.
- Access Economics assumes that it would take three years to convert all the above base case positions.
- It is also assumed that all positions could be converted without being restricted by FTE constraints, since most are metropolitan and with a largely feminising or feminised health workforce, preferences for part-time are common.
- Remuneration for both contractors and APS positions are assumed to increase at 3.94% per annum, the average for professional health workers over 1998-2008 (AIHW, 2009).

Conversion is recommended to commence immediately. The main risk is in the first year in terms of timing (it is already October), but this is countered by the current economic climate and being able to pick the 'low hanging fruit' – hence it is costed as a full year. Over the next ten years, conversion of GPs to APS is expected to yield savings of $15.9 million, and of other positions $19.8 million, for a total savings of $35.7 million (Table 4.7.

Table 4.7: Budget impact of contract conversions (nominal $)

Description	09-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	Total
Doctors converted (FTE)	*9.1*	*18.2*	*27.3*	*27.3*	*27.3*	*27.3*	*27.3*	*27.3*	*27.3*	*27.3*	*27.3*
Doctor savings ($m)	$0.5	$1.0	$1.6	$1.6	$1.7	$1.8	$1.8	$1.9	$2.0	$2.0	$15.9
Others converted (FTE)	*42.4*	*84.9*	*127.3*	*127.3*	*127.3*	*127.3*	*127.3*	*127.3*	*127.3*	*127.3*	*127.3*
Other savings ($m)	$0.6	$1.3	$2.0	$2.0	$2.1	$2.2	$2.3	$2.4	$2.5	$2.6	$19.8
Total converted (FTE)	*51.6*	*103.1*	*154.7*	*154.7*	*154.7*	*154.7*	*154.7*	*154.7*	*154.7*	*154.7*	*154.7*
Total net savings from integrated workforce ($m)	**$1.1**	**$2.3**	**$3.5**	**$3.7**	**$3.8**	**$3.9**	**$4.1**	**$4.3**	**$4.4**	**$4.6**	**$35.7**

Source: Access Economics.

4.3 Professional alternatives to GPs

Physician Assistants (PAs) and Nurse Practitioners (NPs) are classes of medical professionals developed by the US Military in the 1960s to cope with shortages of physicians. Both broadly perform a similar function: to undertake a range of duties that require high level training, but not the full expertise of physicians. Hooker (2006) notes that NPs have a stronger emphasis on health promotion and disease / injury prevention than PAs. PA/NPs usually work under the supervision of a physician, and are collectively referred to as 'non-physician clinicians' or 'physician extenders' in the literature. Dueker et al (2005) describes the differences and similarities between the two thus:

> *Physician assistants (PAs) perform essentially the same tasks as NPs; they provide preventive health services, diagnose illness, conduct physical examinations, order laboratory tests, develop and carry out plans for treatment, consult and collaborate with, and refer cases to, other providers. PAs are not nurses, however; they are mostly graduates of two-year medical training programs. Although the services of PAs and NPs are largely interchangeable, there are subtle differences between their practice characteristics.*

PAs/NPs are highly cost effective, significantly lowering total costs per service in managed care organisations (Roblin et al, 2004). PAs can undertake around 85% of the duties of a physician (Grzybicki et al, 2002) but together with NPs, they only cost around half as much as physicians (Hooker, 2000)[17]. Meta studies have found that – for the duties they undertake – PA/NPs have equivalent health outcomes to physicians (Horrocks et al, 2002 Kleinpell et al, 2008). Studies have also found that PAs and NPs are more productive than GPs in the tasks that they perform (Hooker, 2006).

In the United States, there are a large number of PA/NPs. In 2008, there were 79,980 PAs (American Association of Physician Assistants, 2008). The latest figures for NPs show their numbers as being 141,209 in 2004 (Health Resources Services Administration, 2005). Together, PAs and NPs represent around 1/6th of the US healthcare workforce. By way of comparison, there were 650,000 physicians in the US in 2007 (Hooker et al, 2007).

Most PA/NPs work in primary care settings, where they account for 25% of the 'generalist practitioner workforce' i.e. GPs and non-physician clinicians (Larson et al, 2003). Access Economics assumes that, given the military background of PAs and NPs and the primary care focus of Defence health centres, that 25% of the positions currently occupied by Defence GPs could be filled by PAs and NPs.

- Dunt (2009) reports that there are currently 136 ADF doctors. This would imply that 35 positions could be converted to PA/NPs.
- In Canada, PAs are only employed by the military (Sigurdson, 2006). As of 2007 there were no civilians employed as PAs in Australia (Hooker, 2007), so it is quite likely that the ADF would be the main recruiter of PAs.
- However, in the JHC silo setting, a reduction in ADF GP costs – even though it would directly benefit the Defence bottom line - would not count as JHC savings.

[17] Hooker actually reports that PAs cost only 44% of GPs, but 50% has been used here to err on the side of caution.

- Accordingly, for SRP modelling purposes it is assumed that the savings can be realised from contractor or APS positions. This does not double count the contractor to APS savings since it is possible to both convert and realign the workforce mix.

While Australia's first PA course (at the University of Queensland) will only start supplying graduates from 2011, there are already a number of NP courses producing graduates (University of Queensland, University of Newcastle, and Edith Cowan University.) Thus, supply of PA /NPs is not a binding constraint and, like contractor conversions, there appears no reason not to commence immediately.

Unlike contractor positions that can readily be converted to APS positions, ADF positions are permanent, and thus PA/NPs can only be substituted as vacancies arise. However, turnover of ADF doctors is quite high – perhaps due to the fact that many of their tasks would be more suited to PA/NPs. Stevens (2005) reported that turnover among ADF GPs was 17% in the Navy and 21% in the Air Force, per annum. As figures for the Army were not supplied, Access Economics conservatively assumes 15% turnover across the ADF. At this rate, 35 positions could be converted by 2010-11 in the ADF and ADF rates are assumed to apply in the modelling.

- The Secretary of Defence (Department of Defence, 2009) stated that ADF positions cost 30% more than equivalent APS positions. Thus, the average ADF GP is assumed to cost $283,352. This is roughly half way between a median contract rate and a mean APS rate.
- Assuming a cost 50% of GP cost for PAs/NPs (Hooker, 2000) the saving per GP converted to PA/NP is $141,676.
- Access Economics assumes that of the 35 potential positions, 17.5 will be taken up by NPs in 2009-10, and 17.5 PAs in 2010-11[10].

Thus, over 10 years, the total savings to JHC would amount to $56.5 million (Table 4.8.)

- The main risk to this projection is that Defence bureaucratic processes may delay the introduction of PA/NPs for several years. [This will be modelled in sensitivity analysis.]

4.4 Summary of model findings

Thus, JHC can anticipate savings of $35.7 million from converting civilian contractors to APS positions, and $56.5 million from substituting PA/NPs for ADF GPs, for a total savings over the next decade of $92.2 million (Table 4.9).

[10] This would represent almost the total graduation of PAs in 2010-11. However, it is also possible that Defence could recruit overseas-trained PAs.

Table 4.8: Budget impact of converting GPs to PA/NPs (nominal $)

Description	09-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	Total
PA/NP (FTE)	*17.5*	*35*	*35*	*35*	*35*	*35*	*35*	*35*	*35*	*35*	*35*
Total net savings from integrated workforce ($m)	**$2.5**	**$5.2**	**$5.4**	**$5.6**	**$5.8**	**$6.0**	**$6.3**	**$6.5**	**$6.8**	**$7.0**	**$56.9**

Source: Access Economics. Note: Includes capital and recurrent expenditure items.

Table 4.9: Budget impact of integrated health workforce (nominal $)

Description	09-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	Total
Gains from converting PSPs to APS											
Doctors converted (FTE)	*9.1*	*18.2*	*27.3*	*27.3*	*27.3*	*27.3*	*27.3*	*27.3*	*27.3*	*27.3*	*27.3*
Doctor savings ($)	$0.5	$1.0	$1.6	$1.6	$1.7	$1.8	$1.8	$1.9	$2.0	$2.0	$15.9
Others converted (FTE)	42.4	84.9	127.3	127.3	127.3	127.3	127.3	127.3	127.3	127.3	127.3
Other savings ($)	$0.6	$1.3	$2.0	$2.0	$2.1	$2.2	$2.3	$2.4	$2.5	$2.6	$19.8
Total converted (FTE)	*51.6*	*103.1*	*154.7*	*154.7*	*154.7*	*154.7*	*154.7*	*154.7*	*154.7*	*154.7*	*154.7*
Total savings PSPs to APS ($)	**$1.1**	**$2.3**	**$3.5**	**$3.7**	**$3.8**	**$3.9**	**$4.1**	**$4.3**	**$4.4**	**$4.6**	**$35.7**
Gains from changing the workforce mix											
PA/NP (FTE)	*17.5*	*35*	*35*	*35*	*35*	*35*	*35*	*35*	*35*	*35*	*35*
Total net savings from integrated workforce ($m)	*$2.5*	*$5.2*	*$5.4*	*$5.6*	*$5.8*	*$6.0*	*$6.3*	*$6.5*	*$6.8*	*$7.0*	*$56.9*
Total net savings from integrated workforce	**$3.6**	**$7.4**	**$8.9**	**$9.2**	**$9.6**	**$10.0**	**$10.4**	**$10.8**	**$11.2**	**$11.6**	**$92.5**

Source: Access Economics. Note: Includes capital and recurrent expenditure items.

4.5 Key risks – integrated health workforce

Risks identified by JHC in relation to the integrated health workforce KRM were as follows.

- The national and international shortage of health practitioners creates a worsening supply market.
- The APS salary packages are not sufficiently attractive to recruit the required number of health practitioners.
- Health inflation pushes salaries beyond the APS rates.
- Imposed FTE workforce caps are a constraint to be overcome.
- Universities are unable to graduate sufficient NPs and PAs to satisfy national markets. First PA grads in Dec 2011.

However:

- Engaging PA/NPs has proved to be a successful strategy employed by allied defence forces to combat shortages of health practitioners.
- As discussed above, the wide variation in GP remuneration should mean that there are a sufficient number that could be interested in APS positions, even though private wage rates are higher, and may rise faster, than the public sector wages.
- Given that that Defence has some 57% more contractors than it requires, and that the current cap is a mixture of FTE and wage expenditure, employing fewer contractors and saving on labour costs should not be a constraint.
- As discussed above, there are already at least three universities supplying NPs, and PA graduates will be available in 2010.

5 Multi-disciplinary primary health care delivery on base

Aside from the requirement that the ADF retains levels of fitness and health suitable for military operations, JHC is also responsible for ensuring a deployable health capability, including in the form of trained, competent medical staff. For many years, this has been interpreted as requiring training support in the form of medical facilities, including hospitals, and the provision of multi-disciplinary health care, on base[19]. These facilities have also been used to provide gainful employment for personnel during peacetime, and in-house health support to the wider ADF.

Despite the apparent value placed on on-site facilities, there are no set, common or consistently applied standards for the provision, equipping and support for medical facilities across the ADF and its bases.

In a series of reviews[20] and even service level agreements, concerns expressed over the state of Defence health services include:

- consistency of care and the location and availability of uniformed and (contracted) civilian workforce;
- command, control, accountability and responsibility for the provision of health care other than on deployments; and
- medical record-keeping;
- consistency of health policies, particularly the services; and
- the availability and roles of permanent military medical personnel.

The provision of medical services on base is underpinned by adequate facilities, capability and materiel. The existence of that underpinning is often an assumed fact. But the current state of facilities, technology, equipment and resources suggests it has been disregarded, or at best discounted. Such functional support has often been regarded as a third order issue after staffing resources and skills and health support on deployment. Further, the split of responsibility for the provision of funding and resources between JHC and the Defence Support Group has seen equipment upgraded usually only when facilities themselves are built or overhauled[21].

Following the various reviews undertaken prior to and as part of the White Paper and Strategic Reform Program, Defence has moved to a model whereby

- JHC retains technical control of ADF health services, and is responsible for the cost-effective delivery of those services to ADF members;

19

[20] Including the Stephens Review, ANAO reports, and the Service Level Agreements between VCDF and the Chiefs of Army, Navy and Air Force.

[21] For example, facilities at Duntroon have not been upgraded since the construction of the Duntroon Health Centre in 1991. (Cogent (2009). *Review of Service Provision in the ACT.*)

- A clearer distinction is drawn between garrison health services, which lie within the purview of JHC, and operational health support, which are retained by the individual services; and
- Greater emphasis is placed on multidisciplinary approaches to health care.

The garrison health model is defined as follows:

> *Garrison Health Support is the health resources and services provided to ADF personnel in the National Support Area. Health support provided from the National Support Area includes health support provided on bases and in barracks and includes the external health services referred by health personnel working in ships alongside any Australian or International port, and that which is purchased from external primary, Secondary and tertiary health support providers. It also includes health support to members posted or travelling overseas but not deployed on an ADF recognised operation, exercise or training activity. It may also include health care to dependants accompanying a member on posting overseas. It does not include offshore operations, force assigned personnel, collective training, exercises and work-up activities, and field training areas. Domestic operations may leverage off existing garrison health support but additional support is not included in the definition. However, as an exception, on an as required basis, and as previously forecasted and agreed in Regional Level Agreements, Garrison Health Support may extend to that provided in designated training areas appropriately equipped for the provision of health support by Defence or contracted staff, to designated training activities.*[22]

The development of the garrison health support model provides a cognitive shift from unit- or service-only based support to consolidated approach enabling the more effective and more efficient use of health resources on site. Garrison health support differs from that provided on operations. The emphasis on bases is on primary health care, as opposed to emergency, trauma or environmental health, as on operations or exercises. A multidisciplinary approach can be more easily enabled through provision of unified access to a range of services, and as needed, case management. Earlier reviews of Defence Health have identified the value in adopting multidisciplinary approaches to health care. They are particularly relevant to two aspects of Defence health care—rehabilitation and mental health.

Civilians predominantly provide garrison health services, including between 80% and 90% of primary health services. That contribution, however, clearly depends on their availability, and potentially, on the nature of cases seen.

Savings to be gained from within changes to the profile of multidisciplinary health care delivery at the garrison level will be drawn from the shift of services from lower quality facilities, often poorly utilised, currently on base to leveraging civilian and off-site capabilities. Organisational and cultural barriers may need to be overcome for such a shift to be accepted by the services, even its financial and service rationale.

[22] *Service Level Agreement 1/09 Garrison Health Support for period 27 May 2009 to 27 May 2010 between the Vice-Chief of the Defence Force Group and the Chief of Army.* The same definition is used within commensurate agreements for Navy and Air Force.

Defence already has undertaken reviews of some facilities, with others underway. As part of that process, a number of on-site ancillary services are flagged for closure. These are predominantly surgery, x-ray, and pathology, with certain inpatients, physiotherapy and rehabilitation capabilities also under review.

Some savings will be realised through the reduction of the costs of specialised labour. The main savings to be realised through the review of health services capabilities offered at bases will benefit DMO through the smart sustainment stream. There may be some smaller savings to JHC through small reductions to MEE expenditure. Facilities and equipment constitute sunk costs. Defence tends to use equipment longer than equivalent civilian organizations, and much equipment is likely to be fully depreciated. Longer-term, Defence should realise the benefits of not carrying the full costs associated with rapid change within medical technology.

5.1 Methodological approach

Defence was able to provide only approximate data of a high level of granularity concerning the existing provision of primary health care offered at ADF bases. Concise cost and usage data was only available for a small number of sites and services. Consistency and ascertaining the underlying components and assumptions of the various sets of data made extrapolation difficult. However, given the small amount of data available, the use of extrapolated and approximate models and of a range of assumptions concerning costs, provision of services and workloads, was unavoidable.

Within the garrison context, health care comprises

- General medical practice;
- General dental practice;
- Regular health screening, the nature and frequency of which depends on Service and role requirements (REF);
- Pre-deployment screening, including preventative health measures (dental, vaccinations, mental health) (REF); and
- Post-deployment screening, including mental health.

Aside from general practice, the emphasis is on maintaining ADF personnel at optimal health in preparation for the possibility of deployment. Thus while health services deal with personnel who are above average levels of health within the community, considerable emphasis is placed in preventative measures. Consequently, together with cultural assumptions concerning the 'right' of members to health care, rates of referrals and specialist procedures undertaken tend to be higher than for commensurate populations within the Australian community. It is assumed that these rates are likely to continue even in the absence of on-site facilities. For the sake of the analysis, it is similarly assumed that current case mixes for different services are likely to continue[23].

Those services above and beyond primary health care are:

[23] This may change, of course, should Defence restrict access to or seek co-payments for particular services or procedures.

- Diagnostic imaging. A number of bases support x-ray facilities, with ultrasound also undertaken at Enoggera. All other imaging is undertaken through commercial providers off-site;
- Surgery. The ADF has five theatres with comparatively low utilisation rates. Contracted specialists undertake surgery, and they may also hold pre- and post-operative consultation on-site;
- In-patient care. A number of bases support full or part-time wards for care ranging from post-operative care to low acuity care, as well as to meet the ADF's duty of care particularly to those members under 18 years old. In-patient facilities may also be used on occasion for mental health surveillance purposes; and
- Pathology. Though JHC material suggest seven garrison host pathology labs, discussion indicate only two-three pathology labs remain in operation, primarily to support ADF training needs.

At present, Defence collects only high-level data on facility resourcing and utilisation, and there is a lack of consistency between regions, bases and units. In a number of cases, the information available may note simply that a base or unit offer 'x-ray', 'pathology' or a 'surgery' capability, but not the details of the services offered at each base. These are likely to be different in each case, reflecting different Service priorities and their governance by different AHS regions (and so budget and support), and in some cases, different arrangements with external providers. In some cases, costs associated with surgery seem to have included in-patient related costs, in others staff could be used to support two or more facilities.

Nonetheless, where detail is available, it is used as the basis for the analysis. For example, the 2006 Provision of Health Services to the Albury-Wodonga Military Area Agreement between the Defence Support Group and [redacted] contains for the pupose of pricing the expected case mix of diagnostic imaging services. This was used as the basis of analysis across those bases understood to have imaging facilities. The differences in the amount of information available on services and bases have meant that different assumptions and models have been used to derive costs and assess potential savings. For operating theatres, data from Duntroon, in which there is a strong degree of confidence, and RAAF Edinburgh was used to derive a 'cost-per-procedure', which was then extrapolated to other garrisons.

Where possible, an 'as is' or base cost for 2009-10 has been ascertained, and future costs calculated using inflation figures for the health sector.

A key point of difficulty has been assessing equipment replacement. Defence tends to use its equipment beyond their normal life-spans and equipment replacement typically requires additional funding or policy proposals as part of a wider facility development. It is a reasonable assumption that most, if not all, imaging equipment, for example, will require replacement within the next 10 years. Renewal of capital in the form of equipment will reduce and eventually eliminate legacy capability—a goal of the draft JHC strategic plan 2009-10 to 2019-20. Doing so, however, leaves JHC with the cost of new equipment, its maintenance, and the challenge of meeting the increasing costs of technology without realising its cost-effective use, particularly in the garrison setting.

For the purpose of developing projections of costs and savings, the analysis assumes all ancillary services will be outsourced. Contracted and commercial providers bear the costs of capital, technological advance and maintenance, and of ensuring the costs effective use of

their use. This is in line with Defence's recognition that health care necessarily must be delivered in the cost efficient manner.

Table 5.1: Known Facilities at Garrisons

Garrison (Unit)	Garrison Size	Operating Theatres	Imaging Facilities	Pathology	In-patients (Beds)
NSW ACT AHS					
Duntroon Health Centre	5550	close	close	nil	28
Kapooka		nil	nil	nil	>19
RAAF Wagga Wagga		nil	nil	nil	>7
GSN NSW AHS					
Holsworthy (1HSB)	3830	close	review/ retain	lab	unknown
RAAF Richmond (3CSH CSG-HSW)	1604	nil	close	lab	nil
Randwick Barracks	400	nil	close	nil	nil
HMAS Albatross	1000	nil	close	nil	unknown
SQ AHS					
Enoggera (2HSB)	3704	retain	retain	lab	52
RAAF Amberley (1ATHS)	2226	nil	close	nil	21*
NQ AHS		nil			
Laverack	4466	Nil	close	nil	30
VIC AHS					
Albury-Wodonga Health Centre	1600	nil	outsourced	nil	20
Puckapunyal Health Centre	1150	nil	outsourced	nil	>5
HMAS Cerberus	2500	close	close	unknown	unknown
SA AHS					
RAAF Edinburgh (4EHS)	2166	close	close	nil	22*
Keswick Barracks	350	nil	close	nil	nil
WA AHS					
HMAS Stirling	861	nil	close	nil	nil
NT AHS					
Robertson Barracks	4100	nil	close	nil	22
Total	35,507	5	13	3	13 sites

Source: JHC (includes current JHC intentions)

*Anticipated new facilities

Anticipated savings from these closures were assessed based on available data, primarily civilian labour costs (contracted and outsourced) and reports on specific facilities (primarily Duntroon and Albury Wodonga). Some data on maintenance and consumables was available, and assumed to be typical of that service. Assumptions were made concerning equipment and capability purchase.

Ongoing costs to Defence for service provision were based on the average fees for service 2007-08, drawn from Medicare/DOHA data.

Key Assumptions

In summary, the analysis is based on the following broad assumptions. Specific facility-related assumptions are listed for each facility-related analysis below.

- Current rates of referral are likely to continue in the absence of on-site facilities.
- Current cases mixes are likely to continue in the absence of on-site facilities.
- Future costs established for 2009-10 and inflated using health care CPI across the 10 years (unless otherwise noted).

Ultimately, the data available is not able to support a conclusive analysis. The following assessment is indicative only.

5.2 Identified facilities and extra service costs

The following outlines the cost models used in each case to assess costs and projected savings that could be achieved through a change in service arrangements.

5.2.1 Diagnostic imaging

Over time, advances in diagnostic imaging may generate cost offsets through early treatment and detection (Productivity Commission, 2005). However, such benefits gained through existing on-site facilities for Defence are limited. From discussions and available data, the diagnostic imaging available at the garrison level is predominantly radiology (x-ray machines). Additional capability—ultrasound imaging—is available at Enoggera. There are some portable ultrasound machines available, but these are not for the purpose of garrison health care. For the majority of cases, however, additional imaging is outsourced to providers in the community. For example, in 2008-09, while 1730 patients were seen at the x-ray facility at the Duntroon Health Centre, 2686 (which may have included some of those seen at Duntroon) were referred to an external provider (Cogent, 2009).

Case Mix Model

In the absence of case mix data, a case mix model for diagnostic imaging was developed based on the 2006 model used for the Albury Wodonga Health Centre, and on which the cost of service provision was based. The types of imaging services and number of each service anticipated annually are set out in the Table below.

Table 5.2: Diagnostic Imaging Case Mix Model

Imaging Service Type	Services	As a % of Total Services
Ultrasonic	117	9.65%
Doppler	0	0.00%
Radiology—Examination of Extremities	301	24.83%
Radiology—Examination of Shoulder or Pelvis	130	10.73%
Radiology—Examination of Thoracic Region	240	19.80%
Radiology—Examination of Alimentary Track and Biliary System	0	0.00%
OPG	186	15.35%
CT Scan	35	2.89%
Mammogram	19	1.57%
Fluoroscopy	4	0.33%
Nuclear Medicine	52	4.29%
MRI	125	10.31%
IVP	2	0.17%
Barium Meal	1	0.08%
Total	1212	100.00%

Source: Agreement between Defence Support Group and [redacted] for the Provision of Health Services to the Albury Wodonga Military Area, 2006.

It was assumed the case mix was not likely to change in terms of the proportion of service type, and that this mix was likely to be duplicated across other garrisons.

Average fees for the imaging services were derived from 2007-08 DOHA/Medicare data, based on Medicare Benefit schedules. Those averages were then adjusted using the health care inflator adjusted for 2009-10 (Section 1.3.2).

Table 5.3: Adjusted Average Fee for Imaging Service (2009-10)

Type	Adjusted Average Fee
Ultrasonic	$127.71
Doppler	$245.45
Radiology—Examination of Extremities	$47.19
Radiology—Examination of Shoulder or Pelvis	$54.10
Radiology—Examination of Thoracic Region	$51.34

Type	Adjusted Average Fee
Radiology—Examination of Alimentary Track and Biliary System	$52.70
OPG	$47.16
CT Scan	$334.59
Mammogram	$106.92
Fluoroscopy	$98.37
Nuclear Medicine	$535.13
MRI	$427.14
IVP	$185.13
Barium Meal	$118.08

Source: Access Economics

Referrals rates are assumed to be 75% of the base population—this reflects available data from both Albury-Wodonga, which is primarily a training facility, and Duntroon, which supports training (RMC Duntroon and ADFA), an operational base (HMAS Harman) and older populations based at Russell, Campbell Park, Brindabella Park and Weston Creek.

The case mix model was used in assessing savings in two ways. First, to calculate cost estimates incurred off-site services. The known exception was for Duntroon, which is covered by a single contract for on and off-site imaging (Cogent, 2009). Second, to generate an alternate means of service provision, though direct fee-for-service, against which savings could be assessed.

There are problems using such a model, of course. For example, it can be expected that garrisons specialising in medical support, including rehabilitation and training may have a higher incidence of referral and reflect different needs. There may be differences between Services: Army, for example, could be expected to incur a greater number of orthopaedic cases requiring assessment than the other services—and the Albury Wodonga case mix reflects that of an Army establishment. However, the data is not available to make a finer or more accurate analysis.

Current Costs of Service

The main costs that could be identified as attributable to JHC are the recurrent costs, including labour costs (civilian contractors), servicing and maintenance of equipment, consumables, and transport. Additionally, JHC is responsible for off-site imaging costs for

- those cases other than radiology (and for Enoggera, ultrasound); and
- radiology cases outside the operating hours of the on-site x-ray facility.

Facilities costs, though incurred through support to the provision of health services, are the responsibility of Defence Support Group. Equipment replacement costs are discussed below. Costs, and the nature and collection of costs, varies according to Health Service Area and contractor. A basic model of costs was derived, from the available data, and where possible known and consistent data was used.

Labour costs were derived using contracted personnel assigned from regional health providers. Where available, the costs attributable to specialist providers were included. For Duntroon, a radiologist attending the facility is provided by the local contractor, but provided 'free of charge' as part of a more wide-ranging contract. Clerical and support costs have been included only where known. It is possible that clerical support may be shared across the garrison: data is not available.

Based on information provided by JHC, the following table represents consolidated costs of contracted specialists at garrisons.

Table 5.4: Imaging: Known and Assumed Labour Costs

Garrison	Contractors (Costs)	Specialists	Alternative arrangements	Support
Duntroon	0.5 radiographer [redacted]		[redacted] ($992,441)	0.5 APS3 ($31,460.00)
RAAF Richmond				
Holsworthy				
Randwick				
HMAS Kuttabul				
HMAS Albatross	0.8 radiographer ($108,618.88)			
Enoggera	1 manager medical imaging 1 radiographer 1 sonographer ($456,172.13)	[redacted] ($146,552.50)		
RAAF Amberley				
Laverack				
HMAS Cerberus	1 radiographer ($135,773.14)			
RAAF Edinburgh		[redacted] ($165,000)		
Keswick				
HMAS Stirling	1 radiographer ($152,143.20)			
Robertson				

Source: Joint Health Command

Based on the available data on labour and specialists, it is assumed that the following facilities are in operation: Duntroon; HMAS Albatross; Enoggera; HMAS Cerberus; RAAF Edinburgh; and HMAS Stirling.

It is not clear whether the specialists listed above use the ADF x-ray facilities, or whether their costs are associated with services at their own facilities. It is possible that other contracted radiologists, either through regional health contracts or on a fee-for-service basis, operate ADF x-ray facilities. While there is no evidence that military medical officers operate or support these facilities, nor is there conclusive evidence that they do not. Arrangements other than those available from contracted personnel data provided by JHC may be undertaken at a garrison level. The arrangements at Duntroon are an example.

Costs for *maintenance, consumables and transport* are derived from those identified at Duntroon in the Cogent Review. Annual maintenance costs of $1040 (2009-10) are estimated for the Duntroon facility. The Cogent Review, however, notes that no certification records for the x-ray machine was available. These were not included in the savings calculation—they are not funded from JHC's MEE budget—but closure of all operating facilities is likely to generate around $0.4 million over ten years in terms of consumables and maintenance.

There are two types of consumables estimated for the Duntroon facility: the first ($4800) is a reimbursement (without provision in the contract) to the contractor for x-ray film, assumed here to be for use at the Duntroon facility; the second ($5000) is described as 'other consumables'. The Cogent Review reports 1730 cases undertaken at Duntroon in 2008-09, leading to an average consumables cost per x-ray case of $5.67, equating to $5.87 in 2009-10. The x-ray case mix carried by garrisons was assessed using the case mix model discussed above, derived from the case mix agreed in 2006 for Albury Wodonga Medical Centre. The proportion of radiology cases was identified (41.94% of all imaging cases[24]). Based on the practice at Duntroon, it was estimated that 75% of those radiology cases were undertaken on-site, with the remaining 25% undertaken off-site (for example, out of facility operating hours)[25]. The number of estimated onsite cases was multiplied by the average consumables costs per x-ray case to arrive at an estimate of the consumable costs per facility.

Naturally, there are some limitations to using the data arrived at using this calculation. First, there are the assumptions inherent in its calculation: that the data is valid and applicable to other sites; and that the proportion of x-rays taken onsite versus offsite is valid. Second, it assumes that the costs of consumables remains constant over time, subject only to general health CPI inflation. The replacement of equipment may increase consumable costs. Retention of equipment may also increase costs, as consumables for dated technologies become increasingly scarce.

Nonetheless, in the absence of more accurate data, these seem reasonable assumptions for the purpose of this analysis.

It was assumed that maintenance and consumable costs at facilities at Enoggera, known to contain ultrasound as well as x-ray facilities, were twice that for smaller facilities[26].

[24] Radiology cases account for 55.36% of all radiology cases within the case mix within the Albury Wodonga Medical Centre agreement. Measured against the base population (1600), that generates a proportion of 41.94%.

[25] Application of the 41.94% referral rate against total base numbers yields 2328. The Cogent Review reports that the number of on-site radiology cases was 1730 in 2008-09. That suggests that 74.3%—rounded to 75%—of radiology cases are undertaken on-site. The Duntroon facility operates only part-time and not on weekends. This is likely to be typical of most facilities. Where facilities operate full-time the proportion of radiology cases undertaken onsite will increase, with a commensurate increase in consumables costs.

[26] This is unlikely the case—ultrasound accounts for only 10% of all cases, while radiology accounts for close to 50%. There is a lack of data concerning costs of ultrasound consumables.

Annual transport costs of $2133 are included in the cost of service provision. This cost is based on one hour per week transporting patients to Calvary Hospital on weekends. There is no data indicating the number of such cases. It appears to be cost additional to other transport services provided at the Health Centre[27].

Given that none of the ADF's on-site facilities can provide the full range of imaging services, it is reasonable to assume similar transport costs are accrued at other facilities.

As noted above, *equipment* replacement costs were difficult to ascertain. These costs would be a major contributor to ongoing provision of services by JHC, but it remained unclear as to when equipment would be replaced. Past practice indicates that Defence uses equipment well beyond full depreciation and that equipment is replaced when facilities are replaced or upgraded.

It was assumed that replacement of x-ray equipment would cost $500,000, excluding facilities costs. Replacement of equipment at Enoggera was assumed to be twice that cost: $1,000,000. Although equipment is most often replaced as part of a larger facilities program, the costs are split such that Infrastructure Division in the Defence Support Group is responsible for facilities costs, while JHC bears equipment costs.

There is no data or planning guidance indicating likely replacement schedule, or the age of existing equipment. Should all imaging equipment be replaced in 2009-10, total equipment costs are estimated at $8,500,000 (15 sites at $500,000, one site at $1,000,000).

Regardless of the presence of x-ray facilities, garrisons are likely to draw on community services for *out-of-hours requirements and for those services other than x-ray*. In the absence of a fully staffed garrison facility, it was assumed that Defence would refer its members to commercial providers in the community, paying the full fee-for-service, when facilities are closed—the material provided suggests a number operate part-time and not on weekends. For Duntroon, that practice held, but commercial provider holds a contract to provide imaging services to Defence for an agreed sum.

To enable an assessment of such costs, the case mix model was applied and full fee-for-service costs attributable to non-x-ray diagnostic imagery was calculated for each facility. It was further assessed that 25% of x-ray cases would be undertaken off-site, reflecting the calculation made above, based on the experience at Duntroon. At Enoggera, the same calculation was made, but assumed that 25% of ultrasound cases were also conducted off site.

Ongoing Service Provision

Assuming that in the absence of facilities within garrison, and redirection of ADF personnel to commercial providers within the community for diagnostic imaging, the following table represents the anticipated costs of diagnostic imaging for 2009-10 at full-fee-for service rates, using the adjusted, averaged rates above.

[27] The Cogent Review indicates that three full-time transport officers (one APS3, two APS2) are attached to the Duntroon Operating Theatre for the purposes of transport of ADF members to specialists, mostly for surgical purposes, between ADF health centres in the ACT, and courier tasks (two daily runs).

Table 5.5: Anticipated Full Fee-for-Service Costs for Diagnostic Imaging (2009-10)

Garrison	Total Cost 2009-2010	Population	Services
Duntroon Health Centre	$532,840.37	5550	4163
RAAF Richmond	$153,995.67	1604	1203
Holsworthy	$367,707.86	3830	2873
Randwick Barracks	$38,402.91	400	300
HMAS Kuttabul	$165,324.52	1722	1292
HMAS Albatross	$96,007.27	1000	750
Enoggera	$355,610.94	3704	2778
RAAF Amberley	$213,712.19	2226	1670
Laverack	$428,768.48	4466	3350
HMAS Cerberus	$240,018.18	2500	1875
RAAF Edinburgh	$207,951.75	2166	1625
Keswick	$33,602.55	350	263
HMAS Stirling	$82,662.26	861	646
Robertson	$393,629.82	4100	3075
Total	$3,310,234.77	34,479	25,863

Savings were calculated through subtracting the full fee-for-services costs plus a nominal sum for transport costs ($7000) from the sum of known or assumed labour and transport costs plus an estimate of fee-for-service costs for non-xray imaging. Savings were indexed using the calculated health CPI through to 2018-19, and set out in Table 5.6 below. The Table does not include costs attributable to facilities support or equipment replacement.

Table 5.6: Anticipated Savings: Closure of Operational Imaging Facilities*

	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total
Duntroon	$534,440	$549,938	$569,186	$581,708	$600,905	$621,335	$639,354	$654,699	$669,757	$685,161	$6,106,483
RAAF Richmond											
Holsworthy											
Randwick											
HMAS Kuttabul											
HMAS Albatross											
	$7,832	$15,937	$16,448	$8,524	$17,381	$17,963	$18,529	$19,019	$19,466	$19,914	$161,014
Enoggera	$509,911	$524,698	$543,063	$555,010	$573,325	$592,818	$610,010	$624,650	$639,017	$653,715	$5,826,218
RAAF Amberley											
Laverack											
HMAS Cerberus											
	$66,944	$68,886	$71,297	$72,865	$75,270	$77,829	$80,086	$82,008	$83,894	$85,824	$764,903
RAAF Edinburgh											
	$123,761	$132,389	$136,993	$134,707	$144,637	$149,550	$153,915	$157,638	$161,270	$164,979	$1,459,840
Keswick											
HMAS Stirling	$132,871	$139,354	$144,215	$144,622	$152,257	$157,431	$162,011	$165,915	$169,734	$173,638	$1,542,048
Robertson											
Total	$1,375,758	$1,431,203	$1,481,201	$1,497,438	$1,563,775	$1,616,927	$1,663,905	$1,703,929	$1,743,138	$1,783,230	$15,860,505

Source: Access Economics

*Does not include savings from forgoing equipment replacement, estimated at $7,500,000 (2009-10), or allow for transition costs. Includes only *known* personnel and specialists.

Facilities Support

Facilities costs are difficult to assess.

For operating theatre at RAAF Edinburgh, the SO AHS-SA provided estimates of $57.4 per square metre (2008-09). This figure is associated with the costs of energy, cleaning, air-conditioning, repairs and maintenance, building staff, fire protection and sundries. It does not cover a range of other costs associated with operating theatres, including waste removal and laundry. As such it may provide a better estimate for an x-ray facility than an operating theatre.

For a facility occupying 50m^2, annual costs would $2,870, or $2970.45 (2009-10). Over 10 years and across 16 facilities, that amounts to $524,762.

The Cogent Review assessed that the Duntroon Health Centre is substandard, with inadequate maintenance. Continued operation at Duntroon implies the eventual replacement and/or upgrade of facilities. It is likely that other facilities would similarly need upgrades or replacement, were imaging to continue at those garrisons. However, there is no data concerning the age or projected replacement of facilities. Ideally, the depreciation of replacement facilities would need to be attributed to total costs. Cost data for facilities replacement tends to be available on a case-by-case basis as individual facilities and their needs are considered. Most data provided by Defence and consultations point to closure rather than refurbishment, upgrades or replacement.

Equipment

Equipment replacement would involve replacement of x-ray table, gantry, cameras and associated items. It is worth noting that as part of contract conditions at Duntroon, the contractor also provides a range of equipment enabling operation of the facility, including the main processing unit, as well as equipment enabling immediate provision of a developed image to an off-site radiologist for assessment. Replacement would offer the possibility of newer technologies, including the incorporation of image processing, transmission and storage technologies that could be integrated into e-health capabilities.

Estimates of equipment replacement may be assumed: as above, for example, where costs of $500,000 for x-ray equipment are posited (and double that for replacement of x-ray and ultrasonic equipment at Enoggera). However, there are no known schedules for equipment replacement. The material provided by Defence and discussions suggest that much equipment is dated or inadequate.

A further consideration for Defence is the rapidity and cost of technological change, both in medical technologies, but also information technologies. Given Defence's experience to date, keeping up with technological change and sustaining medical capability in this area will be difficult. Further, medical technologies are a key driver of health care costs, and awareness of and demand for new technologies is likely to continue to increase (Productivity Commission, 2005). Depreciation regimes are unlikely to reflect the rate of technological change and renewal, and can only be supported by high utilisation rates—not the case currently within Defence.

JHC would be better placed to take advantage of those improvements, such as miniaturisation, that enable increased portability and robustness of technology in the field. Given the pressure to generate increased efficiencies within the JHC budget, and the low utilisation of existing facilities, supporting and sustaining numerous imaging facilities in garrisons will become untenable.

Summary: Imaging Facilities

Allowing only for labour and recurrent costs (aside from facilities), it is possible that JHC could realise $15.9 million from the closure of all garrison imaging facilities. A conclusive list and the anticipated closure, or retention and replacement, of facilities is needed to give more structure to these figures: current and anticipated closures will reduce the estimate, while inclusion of previously unknown labour costs, equipment and facilities costs will increase it. The analysis also assumes that the alternative to on-site facilities is the use of civilian facilities on a fee-for-service basis, using the AWMA health agreement model. Further savings could be realised through contractual arrangements using a similar model[28].

The lack of clarity surrounding the costs and the validity of a number of the assumptions used to derive both the model and savings lend considerable uncertainty to the projected savings.

5.2.2 Surgery

As with imaging, surgery facilities have been retained primarily for training purposes. Like imaging facilities, they are operated almost exclusively by civilians. Military medical officers and nurses serve only as assistants; many of the surgeon specialists may also serve as ADF Reservists. Much of the surgery undertaken at ADF surgical facilities is of lower risk and complication—high risk, emergency and complicated procedures are referred to civilian hospitals—and a restricted number of surgical disciplines are undertaken at ADF facilities.

Surgical facilities at Enoggera are likely to be retained at least for the short-term for training purposes, with theatres at Duntroon, RAAF Edinburgh, HMAS Cerberus and Holsworthy due to close. (There is also mention in the data provided of an operating theatre at RAAF Richmond.) The arguments regarding training are blunted by the fact that much of the surgery undertaken at ADF facilities does not prepare military medical officers for operational conditions or the cases most likely to be encountered in an operational setting. Further, there is evidence to suggest that military staff are not available to support the surgery undertaken in ADF theatres.

Surgical costs comprise

- Specialist surgeons (contracted) for surgery and for pre-operative and post-operative visits (and associated travel time). Six regular surgeons are used at RAAF Edinburgh. HMAS Cerberus used nine regular surgeons, reporting that the viability of services were threatened with the departure of four of those surgeons (affecting orthopaedic, plastic, general, and obstetrics and gynaecology surgery). There are seven specialists servicing Duntroon, as well as eight anaesthetists. The specialities practiced at base operating

[28] [redacted] agreement covering Duntroon and the ACT more generally is [redacted] However, the AWMA health agreement model suggests significant savings could be made should tenders be sought for JHC's imaging needs for the ACT.

theatres vary between sites, making generalisations (and construction of a case-based model) difficult[29];

- Anaesthetists (contracted). Duntroon costs, based on DVA rates, are estimated at $481,448 for 2008-09;
- Surgical team. Staffing resources at Duntroon comprise six nursing staff, one health services assistant and one CSSD technician, all contacted[30]. Data from RAAF Edinburgh combined theatre and recovery staff. The report on HMAS Cerberus indicate a lack of qualified surgical assistants;
- Consumables and pharmaceuticals. These comprised approximately $8,600 per month at HMAS Cerberus (2009); $74,466 for 2008-09 at RAAF Edinburgh; and $304,076 at Duntroon (2008-09). Figures for other sites will depend on workload);
- Operating theatre equipment. Some specialist equipment may be rented (RAAF Edinburgh has provided an annual figure of $27,730 for 2008-09). Some redundancy in equipment may be required for safety and medico legal (and insurance) purposes;
- Maintenance and equipment servicing. These costs comprise $1600 per month ($19,200 for 2008-09) at HMAS Cerberus; and $5,531 (2008-09) for biannual inspections at RAAF Edinburgh; and $36,520 at Duntroon (estimated costs for 2008-09, and includes $20,520 for oxygen, nitrous and medical air);
- Utilities and garrison support. These also vary widely, from $24,796 at RAAF Edinburgh for 2008-09; $223,545.18 at RAAF Richmond in 2006-07, which includes gas, laundry, waste removal and garrison support; and $154,977 (2008-09, comprising electricity, gas, waste removal, waste and laundry) at Duntroon); and
- Transport. A transport and logistics cell is attached to the Operating Theatre at Duntroon. The cell includes three drivers (one APS3, two APS2s) to assist with patient transport between ADF health centre and to and from specialists' rooms and hospitals, and to undertake courier runs. The Senior Health Officer AHS Victoria has flagged that closure of HMAS Cerberus' operating theatre may require an investment in 'specialised' transport to take patients to civilian hospitals.

Garrison theatres are not used for major or more specialist surgical support. JHC would incur the costs associated with non-garrison surgery, which would be undertaken by contracted specialists in the private or public health system. At Duntroon, 860 cases across four speciality disciplines were undertaken in the operating theatre, while another 397 cases were undertaken at external hospitals[31]. Each of the 860 cases cost an average of $3,500, totalling $3.088 million.

Two facilities—Duntroon and HMAS Cerberus—need considerable investment to upgrade them to the level necessary to comply with legislative and regulatory standards, and to allow them to continue to provide their contracted specialists with the support they require for

[29] For example, Duntroon operating theatre (as at August 2009) provides services in orthopaedic surgery, general surgery, plastic surgery, urology, oral surgery and endoscopy; HMAS Cerberus has lost contracted surgical services in orthopaedic surgery, plastics general surgery, and obstetrics and gynaecology surgery; RAAF Edinburgh reports services in orthopaedic surgery, ENT surgery, general surgery, plastic surgery and oral surgery.

[30] Cogent (2009). *Review of Service Provision in the ACT*, Annex B, p11.

[31] Cogent (2009). *Review of Service Provision in the ACT*, Annex B, p3.

surgery[32]. A business case put forward by the Senior Health Officer AHS South Australia suggested costs associated with building and equipping a new operating theatre at RAAF Edinburgh would cost $2 million. Another report estimates replacement of the orthopaedic and general surgery items at Duntroon in the order of $250,000 to $300,000[33]. The Senior Health Officer AHS Victoria has expressed concern over the state of the operating theatre at HMAS Cerberus in view of medico-legal requirements (Department of Defence 2009f).

The viability of surgery depends heavily on the presence of specialist surgeons willing to use base facilities. Poor and old equipment has been cited as a contributing factor for the resignation of contracting surgeons at HMAS Cerberus, and is particularly evident with regard to the orthopaedic and general surgical items and equipment at Duntroon. The scheduling of theatre is another factor—specialists are unable to incorporate ADF personnel into their normal schedules at civilian hospitals.

The information available suggests that at best, operating theatre of bases operate at only part capacity, even when fully staffed for purpose. According to the Cogent Review, Duntroon, for example, operates for approximately only half the available sessions per week. Specialist consultations, both pre- and post-operative, are scheduled but often cancelled or postponed for a variety of reasons.

Base operating theatres are supported by in-patient accommodation. Elimination of operating theatre reduces the need for and level of care at inpatient facilities. Savings from reducing and closing inpatient facilities are considered below.

Analysis of potential savings from the closure of operating theatres is offset through the use of both surgical facilities and expertise in civilian facilities.

The only readily available data on which to make substantive comparison of costs are that provided by the Cogent Review of ACT health facilities and the business case put forward by the Senior Health Officer for AHS South Australia in support of continuing surgery facilities at RAAF Edinburgh. The two sets of cost data are not consistent. For example, the RAAF Edinburgh data would appear to underestimate facility support costs and consumables/pharmaceuticals as compared to the Duntroon data. The Cogent Review for Duntroon uses DVA rates to assess anaesthetist charges and includes pre- and post-operative consultations by the visiting medical specialists.

Nonetheless, an estimated cost per procedure can be generated using Duntroon data. In 2008-09, 860 procedures were undertaken in the Duntroon operating theatre, at an estimated cost of $3,088,222, or $3,591 per procedure. From the RAAF Edinburgh data, the commensurate charges for the 2008-09 procedures had they been undertaken in off-site at a civilian facility, were provided: they totalled $1,544,206, or $3010 per procedure. Further work, including the derivation of a case mix model, would help refine both measures.

Aside from Duntroon, there is no data indicating the number or costs of procedures undertaken at other operating theatres, or within the civilian sector. However, the number of

[32] Cogent (2009). *Review of Service Provision in the ACT*; Department of Defence (2009) *Brief for CIHLTH: HMAS Cerberus Health Centre Operating Theatre*, 18 September 2009.

[33] Cogent (2009). *Review of Service Provision in the ACT*, Annex B, p11.

procedures undertaken on-site as a proportion of total garrison population for Duntroon is 15.5%, with another 397 cases, or 7.2%, undertaken at external hospitals.

In total, 22.65% of the Duntroon garrison population underwent operational procedures in 2008-09. The proportion undergoing procedures at the on-base theatre at RAAF Edinburgh was 23.68%—the overall rate receiving surgical treatment, both at RAAF Edinburgh and in civilians hospitals, may be higher, but no data is available at this time. At a gross level, considering all therapeutic procedures, a rate of 22.65% is low compared to the general population (if perhaps typical of males between the ages of 15 and 35). For surgical operations alone, the Australian average is 34.96% (34,959 per 100,000 heads of population); for the ACT, the average is 24.72% (24,721 per 100,000 heads of population)[34].

Given the absence of specific data and given the variation between sites, only broad conclusions can be drawn. The on-site cost data from Duntroon is considered to be more comprehensive than that from RAAF Edinburgh, which omits a number of cost contributors. For the purpose of the analysis, the Duntroon referral rate of 15.5% has been used, although this may underestimate the number of procedures undertaken at other garrisons (for example, RAAF Edinburgh).

Table 5.7: Estimated Operating Theatre Costs and Commensurate Outsourced Costs (2008-09)

Garrison	Size	Surgical Cases*	Duntroon-based comparative costs	Outsourced costs (RAAF Edinburgh data)
Duntroon	5550	860	[redacted]	[redacted]
Holsworthy	3830	594	[redacted]	[redacted]
Enoggera	3704	574	[redacted]	[redacted]
HMAS Cerberus	2500	388	[redacted]	[redacted]
RAAF Edinburgh	2166	336	[redacted]	[redacted]
Total	17750	2751	$10,516,186	$8,815,285

Source: Access Economic, JHC, Cogent

*Estimates based on Duntroon rate of referral, and do not include cases dispatched to civilian hospitals. There is no data on cases referred to civilian hospitals from the other garrisons.

#This calculation, which includes only hospital and specialists costs, is not dissimilar to Cogent's estimate of [redacted] (Cogent (2009)), which includes additional staff and pre- and post-operative patient support costs.

As assumed for diagnostic imaging, potential savings comprise the difference between operating costs and costs attributable through use of civilian facilities. Savings across the five garrisons are approximately $1.6 million for 2009-10.

As noted by the Senior Health Officer AHS Victoria, use of only civilian facilities, or military sites embedded in civilian hospitals, will entail transport costs. At Duntroon, a transport and logistics cell comprising APS staff is attached to the Health Centre, undertaking a number of patient transport and courier tasks. It is likely, but unconfirmed, that similar cells are attached to other garrison health centres. Given that the Duntroon cell already transports patients

[34] Data drawn from Medicare statistics, available at https://www.medicareaustralia.gov.au/statistics/mbs_group.shtml

between health centres within the ACT and to specialists and hospitals, a majority of patients are likely to be able to use such services. However, assuming that the increased reliance on civilian hospitals and facilities will require one further driver (APS 2) and an additional vehicle, the increased cost for 2009-10 will be approximately $96,372[35] for each garrison. These indicative transport costs have been factored into Table 5.8 below.

As with Diagnostic Imaging, replacement of equipment has not been factored in, nor have schedules for closure, upgrades of facilities or replacement schedules, for much the same reason. Discussions and information provided by JHC suggests that should operating theatres be retained, most is not all would require significant investment in terms of the facility and equipment replacement and upgrades.

[35] One driver at APS costs $57,772 (FINMAN 4), plus vehicle costs of $28,000, maintenance of $4,000, operating costs $5,000 and insurance of $1,600.

Table 5.8: Estimated Savings from Closure of Operating Theatres and Outsourcing to Civilian Facilities*

Garrison	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total
Duntroon	$403,266	$414,961	$429,484	$438,933	$453,418	$468,834	$482,430	$494,009	$505,371	$516,994	$4,607,701
Holsworthy	$248,423	$255,628	$264,575	$270,395	$279,318	$288,815	$297,191	$304,323	$311,323	$318,483	$2,838,474
Enoggera	$237,080	$243,956	$252,494	$258,049	$266,564	$275,628	$283,621	$290,428	$297,108	$303,941	$2,708,868
HMAS Cerberus	$128,690	$132,422	$137,057	$140,072	$144,695	$149,614	$153,953	$157,648	$161,274	$164,983	$1,470,409
RAAF Edinburgh	$98,622	$101,482	$105,034	$107,345	$110,887	$114,657	$117,982	$120,814	$123,592	$126,435	$1,126,849
Total	$1,116,082	$1,148,448	$1,188,644	$1,214,794	$1,254,882	$1,297,548	$1,335,177	$1,367,221	$1,398,667	$1,430,837	$12,752,300

Source: Access Economics

*Extrapolated from Duntroon data (Cogent 2009) and civilian cost estimates based on the RAAF Edinburgh 2008-09 case mix.

Summary: Operating Theatres

There is reason to be sceptical about the prospective savings generated in the above analysis; they are extrapolated from costs estimates from two different facilities, with different case mixes and use of specialists. Further, procedure-centred costs are not the norm in assessing the costs of health care, but there is inadequate information enabling an estimate of case-mix adjusted hospital separation costs. However, there is some confidence that the analysis has generated a broad indication of prospective savings.

While prospective savings from the closure of these facilities may be higher, there are other factors likely to be not fully incorporated, including pre- and post-operative in-patient care, that may detract from those savings. It is difficult to draw stronger or more accurate conclusions given variation in case mix and garrisons' circumstances and costs, without additional and better data.

Based on the analysis, it would appear that the immediate closure of all operating theatres may be able to generate $12.75 million in savings. More accurate assessments need to be generated based on actual costs, case mixes, assessed closures, and transition and support arrangements.

5.2.3 In-patient Facilities

Material from Defence indicates that 13 garrisons have in-patient facilities. These are listed below (Table 5.9) together with the available data on size (number of beds) and average bed occupancy.

Table 5.9: Available Data on In-patient Facilities

Garrison	Beds	Occupancy*
Duntroon	28	10
Kapooka		19
RAAF Wagga		7
Holsworthy		
HMAS Albatross		#
Albury Wodonga Medical Centre	20	5
Puckapunyal Medical Centre		5
HMAS Cerberus	30	20
Enoggera	52	15
RAAF Amberley	21	6
Laverack	30	12
RAAF Edinburgh	22	2
Robertson	22	
Total	225	106

Source: JHC

* Where a range was provided (eg 10-20 bed occupancy), an average was assumed.

Described as 'very low'.

Although 13 sites have in-patient facilities, studies sponsored by JHC suggest that few beds are used for the purposes of post-operative surgery. For example, the Cogent Review states that many of the patients housed as inpatients at Duntroon are there under 'duty of care' provisions, including members discharged from civilian hospitals, or who live alone or in the 'lines'[36]. Discussions with JHC indicate a preference for retaining some low-acuity care at facilities where Defence has a duty of care for particularly under-age personnel. Discussions suggest that some facilities—for example, at HMAS Albatross—have been retained in view of the lack of capacity within the community. However, data is not available that would allow a comprehensive assessment of in-patient load on community facilities.

A further argument for retention may arise from broader national security concerns: in the event of a pandemic or major terrorist attack, garrisons may become sources of additional capability in the form of beds and medical assistance. No planning or such a requirement, nor incorporation into the SRP framework, is evident, however.

Mental health concerns may also require some in-patient facilities at bases. While ADF personnel required to undertake involuntary treatment must enter the local public health system in the local jurisdiction, there will be a number for whom commanders and medical personnel have concerns, but who may not require involuntary treatment. The Dunt Review also notes that inpatients facilities on bases may be used for ADF personnel who threaten self-harm or are suicidal, in the 'usual' event that they are not accompanied and admitted the casualty department at the local public hospital, and that that such arrangements are viewed with misgivings by Medical Centre staff.[37] It is possible that in-patient facilities may be used by personnel returning from deployment suffering from adjustment problems, and lacking support off-base[38]. The Review, however, does not make an explicit recommendation concerning the ongoing use of inpatient facilities for ADF mental health needs.

Studies of options for and based on the Albury-Wodonga Medical Centre are used to assess costs for inpatient facilities. It is worth noting that the average cost of a bed per night derived in those studies, $550 (2007) and the equivalent Puckapunyal rate (used by the consultants undertaking the studies as the national cost) of $573 (2007)[39], is considerably lower than the costs derived in the ANAO 1997 Report of $850 to over $2000 (1997)[40].

For the purpose of this analysis, costs are based on the costs of bed per night and the occupancy data provided by Defence. To this end, occupancy rates at Holsworthy and at Robertson are assumed to be comparable for those at Enoggera (15 beds), while HMAS Albatross the occupancy, described as 'very low', is assumed to be two beds.

[36] Cogent (2009). *Review of Service Provision in the ACT*. p21.

[37] Dunt, David (2009). *Review of Mental Health Care in the ADF and Transition through Discharge*, p46.

[38] Dunt, David (2009). *Review of Mental Health Care in the ADF and Transition through Discharge*, p91

[39] Grosvenor Management Consulting (2007). *Defence Health Services: Risk and cost assessment of health delivery options*, p44.

[40] ANAO (1997). *Australian Defence Forces Health Services: Performance Audit*, Audit Report No. 34 1996-97, para 4.15.

Following the approach provided in the Grosvenor Report on Defence Health Services (Grosvenor 2007), current bed per night costs are based on the bed per night cost for Puckapunyal, $631.55 (adjusted for 2009-10)[41]—see Table 5.10.

Table 5.10: Estimated Current In-patient Costs

Garrison	Reported Average Beds Occupied per Night	Annual bed nights	Estimated current costs (2009-10)
Duntroon	10	3650	[redacted]
Kapooka	19	6935	[redacted]
RAAF Wagga	7	2555	[redacted]
Holsworthy	15	5475	[redacted]
HMAS Albatross	5	1825	[redacted]
Albury Wodonga Medical Centre	5	1825	[redacted]
Puckapunyal Medical Centre	5	1825	[redacted]
HMAS Cerberus	20	7300	[redacted]
Enoggera	15	5475	[redacted]
RAAF Amberley	6	2190	[redacted]
Laverack	12	4380	[redacted]
RAAF Edinburgh	2	730	[redacted]
Robertson	15	5475	[redacted]
Total	136	49640	$31,350,335

Source: Grosvenor (2007), JHC

The data from JHC suggests average utilisation rates of 30% of the available beds, which aligns with the Grosvenor data. Cost savings could be achieved through

- Reduction in the overall bed numbers in facilities;
- Conversion of a proportion of current beds to low-acuity care; and
- Use of community nursing for the off-base and at-home care of members.

Reduction of overall bed numbers will have greatest effect at the larger facilities. By way of example, according to the material provided by JHC, Kapooka in-patients is staffed by one nurse unit manager, six registered nurses and four enrolled nurses, one of which functions as ward clerk. The staff cost totals [redacted] including allowances. Reducing staffing levels by one-third would generate savings of approximately [redacted] Reduction in staff numbers would also be dependant on regulatory requirements.

Conversions of beds to *low acuity-care* would achieve a similar reduction in staff costs, as the intensity of care would be reduced. Costs of full conversions would need to be factored into a future costing; that in turn would most likely depend on facilities repair or upgrading. In assessing the costs and risks associated with differing options, Grosvenor used as the basis for

[41] The 2007 figure was $593 per bed per night (Grosvenor, 2007).

a lesser level of health care the bed per night costs for the AWHC, $585.76 (2009-10).[42] Assuming a full conversion to an AWHC level of care, at reduced costs, Defence may realise potential savings of $4.05 million[43] for 2009-10, as set out below (Table 5.11). Determining how to realise these savings however, will be difficult, given the assumptions made in the calculations.

Table 5.11: Indicative Potential Savings through Reduction of Level and Cost of In-patient Care

Garrison	Estimated current costs*	Low care costs (Based on AWHC)	Possible Savings (2009-10)
Duntroon			
Kapooka			
RAAF Wagga			
Holsworthy			
HMAS Albatross			
Albury Wodonga Health Centre			
Puckapunyal Medical Centre			
HMAS Cerberus			
Enoggera			
RAAF Amberley			
Laverack			
RAAF Edinburgh			
Robertson			
Total	$31,350,335	$27,302,000	$4,048,335

Source: Access Economic, JHC

* From Table 5.10 above.

Last, *community nursing* could be used to provide care for a number of members currently admitted as in-patients. The analysis is based on otherwise steady state conditions (no conversions or reduction in facilities' size) and the following assumptions:

- one third of current in-patients are able to be cared for through community nursing;
- a three to one ratio of patients to community nurse;
- provision of transport for the nurse; and
- a minimum presence of a full-time community nurse (a Registered Nurse) at garrison.

Under those conditions, annual costs and potential savings would be in the order of $7.38 million, as set out in Table 5.12 below. This figure does not include aids, installations, other in-home assistance or transport that may be incurred through in-home care.

[42] Adjusted from the 2007 cost per bed night of $550 (Grosvenor, 2007). As the Grosvenor Report, low acuity care may incur additional costs through increased use, and provision for guaranteed use, of off-site civilian facilities.

[43] This figure does not specifically allow for contractor to APS conversions or the use of assistant physicians or nurse practitioners.

Table 5.12: Indicative Potential Savings from Partial Conversion to Community Care

Garrison	Estimated current costs	Community Nursing Costs	Ongoing In-Patient Costs	Total Revised Care	Potential Savings
Duntroon					
Kapooka					
RAAF Wagga					
Holsworthy					
HMAS Albatross					
Albury Wodonga Medical Centre					
Puckapunyal Medical Centre					
HMAS Cerberus					
Enoggera					
RAAF Amberley					
Laverack					
RAAF Edinburgh					
Robertson					
Total	$31,350,335	$2,964,868	$20,605,564	$23,971,932	$7,378,403

Source: Access Economics, JHC

Summary: In-patient Facilities

Potentially, reductions in bed numbers, conversions to low acuity care and the use of community nursing have the potential to offer JHC considerable savings. Offset against those savings must be the costs associated with facility closure and redesign, conversion of wards to low-acuity care, and support to community nurses. The data and information available on facilities and services is insufficiently comprehensive or accurate to allow estimates of savings with any confidence, and without duplication of savings assessed elsewhere (for example in Section 4). The mix of bed reductions, conversions to low acuity care and use of community nursing may differ by garrison—and will depend on decisions regarding other facilities at garrisons, particularly retention of surgical capacity—as will their timing from current traditional care. Nonetheless, the analysis suggests savings may be significant and these changes to in-patient facilities should be factored into future planning in line with the Garrison Health services model.

5.2.4 Pathology

Over the last few years, Defence has sought to consolidate its pathology labs. Material received from Defence indicate pathology services remain at

- Enoggera Barracks;
- Holsworthy Barracks; and
- RAAF Richmond.

All facilities are flagged for review or closure. The Stephens Review questioned the continuing viability of the Army and Air Force pathology laboratories on the basis of the level of training,

issues with supervision and difficulty in obtaining NATA accreditation, needed to help attract ADF Pathology Technicians (Stephens 2004).

Garrison health services continue to send pathology samples to local commercial services as well as ADF facilities. For example, Duntroon uses RAAF Richmond for a limited range of pathology tests for blood samples taken from Monday to Thursday. For all other tests, a local service is used.[44] The average monthly thoughput in 2008-09 is 580 episodes, but a breakdown between the use of local commercial services and RAAF Richmond is not available, nor are costs associated with each service.

Concurrence of Army and Navy is needed for further information regarding the pathology services at Holsworthy (1HSB), Enoggera (2HSB) and RAAF Richmond. At present, there is insufficient information on which to assess potential costs and savings from reductions or consolidations in pathology services.

5.2.5 Ancillary Services

It may be possible to derive further savings from outsourcing of physiotherapists, podiatrists, dieticians and exercise therapists. Some, particularly physiotherapists, may be able to be converted to APS (covered in Section 4). However, there is adequate data regarding existing services to make an assessment of potential savings, and savings are expected to be minimal as many are already on flexible part-time arrangements.

5.2.6 Multidisciplinary Healthcare

Multidisciplinary healthcare has been shown to generate improved patient outcomes as well as helping to lower hospital costs (Cowan et al 2006, Vazirani et al 2005). Typically, multidisciplinary health teams comprise a medical practitioner, an allied health practitioner and/or a specialist nurse practitioner. In the garrison setting, the greatest focus of multi disciplinary healthcare is on mental health, and rehabilitation.

Rehabilitation lies in the general duty of care of commanders, but is also a formal responsibility when an injury is compensable (Stephens 2004). The ADF Rehabilitation Program established a case management model functioning alongside the clinical program. Health Directive No. 290 directs Command, Defence health professionals and the rehabilitation program case manager to work closely together to assess and support the member's successful return to work, or if need be, discharge. Early intervention is emphasised and provisions are made for a case management approach to resolving the disability.

The rehabilitation program has already moved to a holistic approach to assessment of cases. Consolidation of garrison health services will improve JHC's ability to provide ongoing multidisciplinary care, which in turn will strengthen the rehabilitation program. The appointment of nurse practitioners will help build the teams that have proven successful elsewhere. While data is not available at this time to assess changes to members' DALYs or QALYs resulting from this approach, the literature suggests that the case management approach set out in Health Directive No. 290 would be enhanced by the use of

[44] Cogent (2009). *Review of Service Provision in the ACT*: Annex J Current Service Provision at JHC ACT Health Facilities, p10.

multidisciplinary teams in assessment and care, rather than the reliance on a single medical officer.

As Dunt (2009) notes, *mental health* has particular challenges for the rehabilitation program. Posttraumatic stress disorders (PTSD) and adjustment disorders are the two most common chronic mental illnesses that trigger rehabilitation programs, although members with these conditions can be difficult to engage and treat. Traditionally rehabilitation programs are oriented towards physical illnesses and disabilities, rather than mental conditions. The nature of the ADF, particularly for operational elements operating at high tempo, is to return members to their units once physical conditions have been resolved. However, mental conditions such as PTSD and adjustment disorders may take longer to resolve. In such conditions, garrison health centres play an important role in monitoring, assessing and caring for members.

Following on from the Stevens Review and then the Dunt Review, Defence is moving to a more holistic, rounded approach to mental health care. Defence has identified a spectrum of individuals from commanders through the medical officers, specialists, providers able to offer assistance and support that are engaged in the assessment and resolution of members' mental health issues[45]. Often the garrison health services will be the first and continuing point of contact for those with mental health concerns. Not only are garrison health services responsible for undertaking pre- and post-deployment checks, including screening for PTSD, but as providers of primary care, they are most often the first point of contact for members experiencing the symptoms of stress and disorders[46]. As with rehabilitation, consolidation of health services in garrison will assist these multidisciplinary approaches to mental health care.

Dunt noted the difficulty of assessing the efficacy of treatment and outcomes for a range of mental health conditions. He recommended, however that mental health services be continue to be considered an integral aspect of primary health care, noting that recourse to contractors and off-site specialists may be necessary given recruitment caps within Defence and difficulty of obtaining services[47]. For the purpose of mental health, on-site psychologists also provide the first point of contact for members, on their initiative or referred by their commanders, but are often housed organisationally and often physically separate from the medical officers and health services. Dunt recommended the psychologist be sited with as part of consolidated garrison health services[48]. While not explicitly a multidisciplinary team approach, co-location increases the ease with which such approach can be implemented as part of primary health care.

Dunt flagged increased facilities cost resulting with relocation. However, the consolidation of garrison health services and outsourcing of ancillary capabilities should allow reallocation of space in existing sites. There may be some costs in terms of rehabilitation and renovations of existing facilities: there is not the data to assess costs or possible schedule. Funding may be available through the additional allocation of $29.949 million for mental health provided through the 2009 White Paper.

[45] See, for example, Defence Health Directive No. 289.

[46] Around 40% of GP consultations are mental health-related (Dunt 2007, p61)

[47] Dunt 2007, p59.

[48] Dunt 2007, p61

In summary, Defence will be able to more effectively pursue multidisciplinary health care outcomes through the consolidation of primary health services within the garrison. Co-location facilitates interaction, and the increased use of nurse practitioners and access to mental health professionals, will also help provide continuity of care in the garrison setting.

5.3 Strategic purchasing

As noted in earlier reviews of Defence Health Services, reports on specific centres and internal assessments, current approaches to the provision of health services suffers from a range of organisational impediments. Recent efforts to make increased use of civilians and commercial services have fragmented between local contracts for services (e.g. the contract with [redacted] in the ACT, and the agreement with [redacted] for health services for the AWMA), fee-for-service or contractual arrangements with specialists (arranged by garrison or health region), and health workforce contracts with providers at the regional level.

There are good arguments for retaining a local approach to some services, including taking advantage of local knowledge and building relationships with providers, some of whom may also be Reservists.

Strategic purchasing arrangements could improve planning, management and the effectiveness of health services across the ADF. The consolidated garrison model being pursued by JHC offers the prospect of the provision of services through a cost-competitive single provider at the garrison or regional level. Some variations may be needed for particular services, as capabilities such as pathology and rehabilitation, are consolidated, and to meet small but specific needs, such as surgery and post-operative care undertaken in the Naval Ward at [redacted] Further, the negotiation of such arrangements should allow provision of training and incorporation of military medical officers in practices as they are available, and to meet their own professional needs.

Importantly, the development of strategic purchasing arrangements would need to be based on a case-mix model to ensure services and service levels are both appropriate to the needs of the ADF and their members and are cost-effective. With regard to specific facilities, such as diagnostic imaging, strategic purchasing arrangements allow Defence to leverage current technologies within the commercial sector while providing commercial partners a secure source of patients.

The analysis undertaken above for diagnostic imaging and operating theatres assumed their replacement through direct fee-for-service. Without being able to contact providers, these are likely to represent ongoing savings even under strategic purchasing arrangements. Further savings that may be achieved through guaranteed numbers and service levels may be offset by provision for training and some degree of incorporation of military medical staff in practice.

In summary, without testing the market, it is difficult to assess potential savings generated through strategic purchasing arrangements. The examples of both Puckapunyal and AWMA provide only partial, if useful, guidance: they do not fully reflect the full savings that could be achieved at garrisons with imaging and operating theatres for example, nor changes in in-patients and low acuity care. Nor do they incorporate ongoing military medical training and practice needs.

It may be that military medical training is the subject of alternative arrangements separate from strategic purchasing arrangements at the garrison-level. Certainly, standards will need to be developed to ensure consistency of arrangements. A phased approach, building on, for example, agreements with [redacted] will permit learning and adaptation.

5.4 Summary of model findings

The analysis argues that there are considerable savings to be made from the exclusion and closure of facilities other primary care within garrisons. Extrapolations from known data, and the application of the approach used at AWHC, suggests savings can be found through

- the closure of diagnostic imaging ($15.86 million), and outsourcing of imaging needs on a fee for service basis;
- the closure of operating theatres ($12.75 million), also outsourced to civilian hospitals; and
- the reduction and conversion of the current in-patient care facilities to low-acuity care, and the increased use of community nursing.

However, there was considerable uncertainty due to the veracity and incompleteness of the data, and so the accuracy of projected savings. In some cases—such as in-patient facilities—it was considered ill-advised to project savings, as much was dependant on garrison circumstances and case-by-case decisions.

A necessary first step in confirming and determining the approach to achieve likely savings will be to generate a definitive list of facilities, their size and operational parameters (number of cases, case mix, and referrals). The operations and necessary refurbishment of facilities can then be properly costed against alternatives.

Table 5.13: Budget impact of multi-disciplinary primary health care (nominal $)

Description	09-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	Total
Duntroon Health Centre											
Savings from closure & outsourcing imaging											
Savings from closure of operating theatre and outsourcing surgery											
Savings from conversion of In-patients facilities	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total for Duntroon Health Centre											
Kapooka											
Savings from conversion of In-patients facilities	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total for Kapooka											
RAAF Wagga											
Savings from conversion of In-patients facilities	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total for RAAF Wagga											
RAAF Richmond											
Savings from closure and outsourcing imaging*	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total for RAAF Richmond	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Holsworthy Barracks											
Savings from closure and outsourcing imaging*	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Savings from closure of operating theatre and outsourcing surgery											
Savings from conversion of In-patients facilities	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total for Holsworthy Barracks											
Randwick Barracks											

Description	09-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	Total
Savings from closure and outsourcing imaging*	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total for Randwick Barracks	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
HMAS Kuttabul											
Savings from closure and outsourcing imaging*	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total for HMAS Kuttabul	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
HMAS Albatross											
Savings from closure and outsourcing imaging											
Savings from conversion of in-patients facilities	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total for HMAS Albatross											
Enoggera Barracks											
Savings from closure and outsourcing imaging											
Savings from closure of operating theatre and outsourcing surgery											
Savings from conversion of in-patients facilities	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total for Enoggera Barracks											
RAAF Amberley											
Savings from closure and outsourcing imaging*	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Savings from conversion of in-patients facilities	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total for RAAF Amberley	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Laverack Barracks											
Savings from closure and outsourcing imaging*	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0

Description	09-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	Total
Savings from conversion of in-patients facilities	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total for Laverack Barracks	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
HMAS Cerberus											
Savings from closure and outsourcing imaging*											
Savings from closure of operating theatre and outsourcing surgery											
Savings from conversion of in-patients facilities	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total for HMAS Cerberus	**$195,635**	**$201,308**	**$208,354**	**$212,937**	**$219,964**	**$227,443**	**$234,039**	**$239,856**	**$245,168**	**$250,807**	**$2,235,311**
Albury Wodonga Health Centre											
Savings from conversion of in-patients facilities	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total for Albury Wodonga Health Centre	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
Puckpunyal Health Centre											
Savings from conversion of in-patients facilities	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total for Puckapunyal Health Centre	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
RAAF Edinburgh											
Savings from closure and outsourcing imaging											
Savings from closure of operating theatre and outsourcing surgery											
Savings from conversion of in-patients facilities	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total for RAAF Edinburgh	**$222,383**	**$233,871**	**$242,027**	**$242,052**	**$255,524**	**$264,207**	**$271,897**	**$278,452**	**$284,862**	**$291,414**	**$2,586,689**
Keswick											

Description	09-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	Total
Savings from closure and outsourcing imaging*	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total for Keswick	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
HMAS Stirling											
Savings from closure and outsourcing imaging	[redacted]										
Total for HMAS Stirling	[redacted]										
Robertson Barracks											
Savings from closure and outsourcing imaging*	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Savings from conversion of in-patients facilities	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total for Robertson Barracks	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total all facilities reviewed	$2,491,940	$2,579,651	$2,669,845	$2,712,231	$2,818,658	$2,914,475	$2,999,882	$3,071,151	$3,141,806	$3,214,067	$28,612,806
Savings from all surgery service outsourcing	$1,375,758	$1,431,203	$1,481,201	$1,497,438	$1,563,775	$1,616,927	$1,663,905	$1,703,929	$1,743,138	$1,783,230	$15,860,505
Savings from all imaging service outsourcing	$1,116,082	$1,148,448	$1,188,644	$1,214,794	$1,254,882	$1,297,548	$1,335,177	$1,367,221	$1,398,667	$1,430,837	$12,752,300
Savings from conversion of in-patients facilities	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total net savings from multidisciplinary health care	$2,491,840	$2,579,651	$2,669,845	$2,712,231	$2,818,658	$2,914,475	$2,999,882	$3,071,151	$3,141,806	$3,214,067	$28,612,806

Source: Access Economics. Note: Includes recurrent expenditure items only, based on available data.

* Labour costs unavailable and so considered non-operational.

5.5 Key risks – multidisciplinary primary health care

Key risks identified with regard the achievement of savings within the multidisciplinary primary health care KRM include:

- Poor data and information concerning the use and costs of services and their alternatives lend uncertainty to the projected savings.
- Capacity within the civilian health sector to accommodate additional ADF services, particularly in rural and remote areas.
- Resistance from within Defence due to a perceived threat to military medical officer and staff training and experience, and loss of relationships with specialists and services, through outsourcing.
- Resistance to change from within the military due to perception of loss of control over health capabilities, standards and relationship with health staff.
- Resistance to change due to a perceived lessening of service, particularly immediacy, and the effect of military schedules and culture.
- The tight coupling between facilities development and changes and upgrades to services, contributing to a loss of momentum for change within Defence.
- Concerns regarding Defence's ability to match increasing health costs experienced in the civilian community.
- Possibility of dispersal and degradation of medical health records through use of civilian facilities.

However, continuing with the status quo also includes a number of risks including

- Failure to realise potential savings through the closure and outsourcing of ancillary health facilities
- Continuing degradation of available on-site health facilities through lags in equipment and procedural technology and improvements, leading to difficulty in attracting specialists and professionals
- Insecure and inefficient reliance on ad hoc contracts with individual specialists and professionals
- Failure to exploit the advantages of consolidation through provision of multidisciplinary health care, particularly in mental health and rehabilitation
- Inadequate on-site support and connectivity for future e-health initiatives, such as the lack of ICT support systems for imaging currently within garrison health care.

However:

- Structured strategic partnerships could be devised to provide surety of services, a reasonable level of care that met Defence's needs, and increased efficiencies in terms of service provision, access to new technologies, and reductions in overheads.
- Wards and health services embedded in and partnerships with civilian hospitals would provide multidisciplinary care, access to services and an environment suitable for the training and experience needs of military medical staff.

- **Despite incomplete and inconsistent data, there would seem sufficient assurance of a reasonable level of savings.**

6 Policy review and rationalisation

This chapter reviews current policy in relation to health service provision to ADF personnel relative to what other Australians receive under Medicare and other publicly funded spending. Specific tasks were to:

1. examine the costs and benefits of individual readiness health requirements;
2. review policy on different types of health checks, for example whether there is a strong evidence basis for morbidity averted given their frequency and the age of recipients;
3. explore risk thresholds for deployment of ADF personnel with medical conditions;
4. identify and quantify potential savings from reducing the frequency of examinations or utilising alternative methods such as e-technology (e.g. online rather than face-to-face mental health screening); and
5. model the overall cost and savings impact for each policy change by year, presenting the findings.

6.1 Policy development and review processes

Section 1.1 outlined the basis of entitlements and access to ADF health care and JHC's evolving role.

> *'JHC has redefined its role over recent years, which has seen a change in focus from one of treatment of injuries to one which encompasses an holistic approach to a member's health including preventative measures, treatment and post injury or illness management. This approach also includes the psychological resilience and the concept of wellness; that is ensuring that members are physically and mentally fit, and have the appropriate aptitude to perform specific roles' (JHC Strategic Plan, 2009-10 to 2019-20:14).*

ADF health policy development and review is prioritised in accordance with the JHC Strategic Plan, and is responsive to changing priorities subject to Ministerial initiatives, CDF direction in relation to outcomes of boards of inquiries and altered community practice from evidence based guidelines. Ideally, all polices are reviewed every three years (although this has not always been able to be achieved due to resource constraints). An e-health initiative is being considered which over time will assist in real-time adaptation and modification of clinical processes (see Section 6.5). Models of care reflect continuous quality improvements e.g. the recent development and implementation of a comprehensive mental health strategy.

In consultation processes, it was considered rare that current care models fall short of delivering clinical best practice or operational need. There are ongoing quality improvement processes in place (coordinated through HQ Joint Operations Command) to feed back to garrison health care providers where ADF members are deployed on operations with incomplete health preparation or inappropriate Medical Employment Classifications (MECs).[48] Any non-compliance with health care policy and operational support instructions tends to reflect a deficit in clinical and corporate governance. Consultations suggested the application of consistent clinical and corporate governance has been difficult due to complex command

[48] MECs are described briefly in Section 6.3.

and control arrangements and there is scope for improvement in this area. Financial accountability was considered to have improved over the past 12-18 months.

In terms of inputs (medical workforce available) and outputs (services received by ADF members), rate of effort data supplied by JHC suggests that the standard of care is higher than that received by civilians. For example, dental care in the ADF is substantially more consistent and comprehensive than that in the civilian community and patient-to-doctor ratios are lower (see Section 7.5). Hospital care tends to be equivalent to that received by a privately insured patient in a private hospital with the top level of health insurance (Ramsay, 1997:2). In addition, ADF personnel receive some mental and allied health services not publicly provided to civilians or provided with substantially longer waiting times. Faster access to services occurs across all service types – notably for common elective procedures such as arthroscopy.

Access to primary care is triaged in terms of timeliness as per Health Directive 919 (para 10).

- **Emergency care** is when members present critically ill or injured, requiring immediate attention, where any delay in care could be detrimental to their chances of survival. Treatment will usually include the immediate transfer of the member to a tertiary health facility where definitive specialist care can be provided.
- **Urgent care** is when members require, or perceive the need for, urgent advice, care, treatment or diagnosis due to serious medical or dental problems. Examples include patients with breathing difficulties, severe pain or with a high fever. The appointment system should be sufficiently flexible to enable these members to obtain health care as soon as possible and ADF health facilities are to have processes in place to anticipate such needs.
- **Non-urgent care.** Members seeking treatment review or non-urgent care, including requests for repeat prescriptions etc, should be directed to seek the next available appointment. If the member believes their condition requires treatment before the next available appointment, they should ask to be assessed by the attending health personnel and managed according to clinical needs. Access to non-urgent dental services is determined by the member's dental classification.
- **Preventive care.** Members requesting preventive health care should be referred to make an appointment with the appropriate health care professional or scheduled clinic. Preventive health care includes, but is not limited to Papanicolaou (pap) smears, routine health examinations or assessments and routine immunisations.

Wait times for access to specialist medical care depend on specialist availability, clinical urgency and operational requirements for readiness of the individual.

Elective surgery is typically surgery that can be delayed for at least 24 hours. The member's condition is assessed by a specialist and a priority category is allocated based on clinical urgency as per the categories following.

- **Category 1.** Members with conditions requiring surgery that have the potential to deteriorate quickly to the point that they may become an emergency, should be admitted for surgery within 30 days.
- **Category 2.** Members with conditions causing some pain, dysfunction or disability but which are not likely to deteriorate quickly or become an emergency, should be admitted for surgery within 90 days.

- **Category 3.** Members with conditions causing minimal or no pain, dysfunction or disability, which are unlikely to deteriorate quickly and which do not have the potential to become an emergency, should be admitted as determined by hospital waiting times and specialist availability.

It has not been possible in this analysis to ascertain whether health outcomes reflect inputs. The last large-scale review of ADF health outcomes was in 2000, concluding that health risk factors were similar to those in the civilian population adjusting for the younger age profile in the ADF (overweight and obesity at 57% for males and 32% for females, smoking at 20%, high cholesterol at 36%, hypertension at 2% and 16-17% consuming five alcoholic drinks or more per day when drinking). Of deaths, 32% were due to natural causes, 27% due to motor vehicle accidents and 17% due to suicide – with the mortality profile also similar to that in the age-gender-matched civilian population (Department of Defence, 2000). A report from the mid-1990s (Ramsay, 1997) concluded that:

> *Although most members of the ADF are in an age group when they should be at peak health and fitness, available health status indicators suggest that injury rates are far greater in the military population when compared with the civilian community... the mortality rate in Land Command is 80 per 100,000, this is twice the all cause death rate for the Australian population and also compares unfavourably to the all cause death rate of the US Army which was 36 per 100,000 in 1996.*

While things may have changed in the past 12 years, the report noted that average annual health costs per capita then were 2.76 times average health costs in the civilian population despite ADF members being medically fit when recruited and having been screened for adverse family history. It concluded that, while the cost difference may be partially explained in terms of the need to maintain operation capabilities, it may also be partly explained in terms of inherent inefficiencies within the provision of health services.

6.2 Methodological approach

- The first task involved examining the costs and benefits of individual readiness health requirements.
  - A first step was to enumerate current policy on health readiness. Policy information was requested from JHC including background documents on how 'equality with other Australian citizens' was established as the basis for the provision of health care to ADF personnel, and what this means in current practice in terms of entitlement and actual access (timeliness and mix of services).
  - A second step was to meet with Colonel Graham Durant Law (in person), Brigadier Tony Gill (teleconference) and others to discuss mechanisms for historical, current and future potential incorporation of the evidence basis into policy (in terms of key issues such as recommended frequency of screening/examinations, identification of target populations where screening is most cost effective, nature of examinations, nature of follow-up health interventions and monitoring etc).
  - Using information from the policy documents provided and discussions, assessments were made in relation to how services to ensure readiness are adapted and modified over time in order to align with new and emerging health

technologies, best clinical practice Guidelines (e.g. from the National Health and Medical Research Council or NHMRC), and with evidence based models of care.

- The assessments focused on where readiness requirements and policies are currently likely to deliver health outcomes cost effectively and areas where they are out of line with other 'thresholds' (recall Section 1.3.3).

- The second task involved reviewing policy on different types of health checks, for example whether there is a strong evidence basis for morbidity averted given their frequency and the age of recipients.
  - Protocols were requested through JHC in relation to dental screening and care plans, mental health screening and care plans, preventive/general health and fitness screening and care plans – as well as any available data on the average number of such services by type that are delivered and associated health outcomes -by age and gender of the recipient. Rate of effort data and relevant Health Directives were received, as well as various relevant Defence Instructions (General), Health Directives, and related policy documents.
  - Outcomes data were not available. As such service provision was compared with clinical guidelines evidence basis for screening, examinations and preventive care.

- The third task was to explore risk thresholds for deployment of ADF personnel with medical conditions.
  - Information was requested through JHC on current practice and outcomes when ADF personnel are deployed and, while on an operations, have a manifestation of a pre-existing or preventable medical condition. Information was specifically requested in relation to dental care and outcomes and prophylactic use of anti-depressants or other pharmacotherapies while deployed.
  - Access Economics explored the frequency of these occurrences and the extent to which they currently constrain combat and health team capacity on operations, seeking the views of deployed and non-deployed medical officers/assistants, nurses and dentists on whether and which readiness requirements are adequate, which are marginal, how this affects operational capacity, what reforms they would recommend, as well as any existing data or research studies.
  - Using these qualitative inputs, Access Economics assessed risk-consequence thresholds from an actuarial perspective with a view to recommending any potential modifications.

- The fourth task was to identify and quantify potential savings from reducing the frequency of examinations or utilising alternative methods such as e-technology (e.g. online rather than face-to-face mental health screening).
  - Information was requested through JHC on whether any screening, triaging or health information provision currently occurs via Defence intranet or web-based services and if this has previously been examined, the provision of past findings.
  - Information was also requested in relation to the ADF Family Health trial – its historical basis, actual cost relative to budget, and benefits in terms of retention of personnel. This was requested as a case study of how monitoring and evaluation of such trials is conducted in practice in terms of cost effectiveness, equity and appropriateness, to establish whether trials should continue beyond their initial funding periods. (Although the ADF Family Health trial is 'below the

line' in terms of the MEE budget, it is an example of the importance of using evidence to form and evaluate policy).

- Finally, having assimilated the input information from the process outlined above the overall cost and savings impact for each policy change was modelled in Excel by year and findings summarised in relation to the 10-year period from potential changes to:
  - screening protocols for dental, mental health, primary care and fitness screening and follow-up care;
  - introduction of alternative forms of screening/care (e.g. e-health);
  - modification of policies in relation to deployment of ADF personnel with medical conditions; and
  - other modifications to individual readiness requirements.

6.3 Screening examinations and follow-up care

The ADF adopts a preventive approach to health care and early intervention in the management of acute and chronic conditions. The ADF *Health Promotion Program* introduced in 2001 (see DI(G) Pers 16-1B) focuses on the identification and reduction of risk factors for chronic illness and is based on the Royal Australian College of General Practitioners (RACGP) preventive practice guidelines.

> *'The periodic health assessments and medical examinations provide an opportunity for timely health interventions and advice as required. Literature review reports show that targeted specific activities are more likely to lead to improved patient health outcomes. Military personnel comprise a subset of the general population with much higher demands on medical fitness. There is a requirement for operational commanders to be assured that their personnel are ready to deploy at short notice without medical limitations.* ***The military population is young and may not visit their medical officer as often as once a year, and therefore the periodic health assessments and medical examinations will provide an opportunity to assess ongoing individual readiness. In an asymptomatic population, these examinations need to include only those clinical tests that are highly specific and show clear value.*** *The specific preventive services that are appropriate for inclusion in the periodic health assessments and medical examinations for ADF personnel have been developed in accordance with evidence-based best practice' (Health Directive 242, para 2, bold added).*

Based on health examinations, personnel are given a Medical Employment Classification (MEC).[50] DI(G) Pers 16-15 outlines the ADF MEC system. Classifications are in Table 6.1 as well as sub-categories. For example, MEC 301 would apply for pregnancy.

[50] Health Directive 236.

Table 6.1: MEC classifications

MEC	Descriptor	Subcategories
MEC1	Members who are medically fit for employment in a deployed or seagoing environment without restriction.	
MEC2	Members who have medical conditions that require access to various levels of medical support or employment restrictions, however they remain medically fit for duties in their occupation in a deployed or seagoing environment. In allocation of sub-classifications of MEC 2 access to the level of medical support will always take precedence over specified employment restrictions.	201 Duty limitations only; 202 Pharmaceutical or medical support; 203 Advanced Medical Assistant or Military Nursing Officer support; 204 Specialist Assistant or Nursing support, 205 Medical Officer support.
MEC3	Members who have medical conditions that make them medically unfit for duties in their occupation in a deployed or seagoing environment. The member so classified should be medically managed towards recovery and should be receiving active medical management with the intention of regaining MEC 1 or 2 within 12 months of allocation of MEC 3. After a maximum of 12 months their MEC is to be reviewed. If still medically unfit for military duties in any operational environment, they are to be downgraded to MEC 4 or, if appropriate, referred to a Medical Employment Classification Review Board (MECRB) for consideration of an extension to remain MEC 3.	301Fit for other duties; 304 Not fit for any duties for between 28 days to 4 months.
MEC4	Members who are medically unfit for deployment or seagoing service in the long-term. Members who are classified as MEC 4 for their military occupation will be subject to review and confirmation of their classification by a MECRB.	401 Employable within current occupation; 402 Fit for other duties and may be deployable in an alternative occupation; 403 Non-effective for >4 months.

Source: DI(G) Pers 16-15.

In addition to the basic sub-classifications, additional employment restrictions for specialist employment streams (that are subsets of broader employment groups) apply for Aircrew (including Air Combat Officers)—A; Controllers (Air Traffic Control Officers)—C; .Divers—D; Parachutists—P; and Submariners—S. Specialists thus have a two-part MEC e.g. MEC1 A1. Specialist Employment Classifications are:

1. Fit for unrestricted specialist duties.
2. Fit for specialist duties but with some restrictions.
3. Unfit for specialist duties in the medium-term.
4. Unfit for specialist duties in the long-term.

Health Directive 236 outlines MEC procedures including guidelines for conducting a MEC Review (Annex C), grievance processes and forms, and information on the Transition Management Service (Appendix 1 to Annex C). The Transition Management Service helps full-time serving members of the ADF who are being discharged on medical grounds, by providing information and services to assist with the transition. DVA provides the Transition Management Service as an extension of the rehabilitation and compensation services provided by DVA (Section 6.4).

6.3.2 General health examinations and follow-up care

A key element of health promotion is the standard Annual Health Assessment (AHA) and the Comprehensive Preventive Health Examination (CPHE) which replaces the AHA every five years for any ADF member. These questionnaire-based appointments include self-reports on general health, injuries, procedures, medication, smoking and drinking levels, stress and fitness, as well as measured biometric data, vaccination needs, pathology, hearing and other test results entered by a nurse or medical assistant. [51] The interview involves a health information component which is focused on tobacco, alcohol, nutrition and physical activity risk reduction. In addition, to this opportunistic health education is provided to members during health presentation for other reasons. [52]

In addition there are pre-deployment and post-deployment health checks.

> *'ADF personnel may be deployed in areas characterised by environmental extremes, endemic disease, poverty and inadequate public health measures. Local medical services may not meet minimum Australian standards in scope or quality. These factors can contribute to disease and non-battle injuries which may have a significant impact on the effectiveness of the ADF. The effects of disease and non-battle injuries can be minimised through proper preparation and follow-up of personnel' (Health Directive 222, para 1).*

'Proper preparation and follow-up' includes ensuring medical and dental fitness for deployment, the application of health countermeasures (e.g. vaccinations), the education of personnel on measures to prevent disease (e.g. regarding water, mosquito protection and so on) and appropriate post-deployment screening and post-activity review of personnel (e.g. regarding traumatic events). Health Directive 222 notes the following eight checks:

1. the pre-deployment medical check confirms the appropriate MEC for deployment, the compatibility of any medical restrictions, and adequate medications as required;
2. the pre-deployment dental check confirms the member is dentally fit to deploy;
3. the pre-embarkation medical confirms no change in circumstances since the pre-deployment medical check, based on declarations by the member and a medical officer;
4. the pre-deployment health and psychological brief raises awareness of any potential health threats in the area of operations and appropriate counter-measures;
5. the return to Australia medical screen and health brief captures health information about the member, exposure to hazards, injuries and any required follow-up;
6. the Return to Australian Psychological Screen (RtAPS is detailed in Section 6.3.4);
7. the post-deployment AHA ensures health issues identified in (5) have been followed up and post-deployment serology has been completed; and
8. the Post Operational Psychological Screen (POPS is detailed in Section 6.3.4).

Timing of the checks is summarised in Table 6.2.

[51] Health Directive 242 Annex A and B provide the assessment and summary report forms for the AHD and CPHE respectively.

[52] Health Directive 246 provides standard information for lifestyle counselling of members regarding risk factors after AHA/CPHE and Health Directive 273 provides procedures for developing pre and post deployment health promotion products (pamphlets, information cards).

Table 6.2: Timing of pre and post deployment health checks

Deployment check	Timing relative to deployment
Pre-deployment medical check	<3mths prior
Pre-deployment dental check	<3mths prior
Pre-embarkation medical	<14 days prior
Pre-deployment health and psychological briefs	during Force Preparation Training
Return to Australia medical screen and health brief	<14 days prior to return
RtAPs	ideally shortly prior to return
Post-deployment AHA	3 months after return
POPS	3-6 months after return

Source: Health Directive 222.

Finally, there are the separation health examinations (general and dental), which are conducted 3-6 months prior to discharge. The Separation Health Assessment is conducted by a medical officer and if a CPHE has been carried out within the previous six months the member can just complete a form (PM 070 *Separation Health Statement*) which is reviewed by a medical officer in consultation with the member. A further CPHE or Separation Health Assessment is not required unless significant medical or psychological problems are identified on the form.[53] Health Directive 278 refers to single-service policies relating to separation of a member from the ADF, and notes that:

> *Separation from the ADF can be stressful for the serving member and/or their families. Separation often affects an individual's personal, professional and social life, as well as future civilian employment. Efficient and comprehensive clinical assessment and health administration are important components of the transition process to determine and articulate the health status of the member at the time of separation.*

DI(G) Pers 16-1 states that:

> *'While there is no requirement for a member of the ADF to be medically or dentally fit at separation, or when transferring from the Permanent Forces to the Reserve Forces, it may be appropriate, in exceptional circumstances, to provide health care immediately after such separation or transfer...' [para 5]*
>
> *All permanent members should obtain a pre-separation medical and dental examination between three and six months prior to separation from the ADF or transfer to the Reserve Forces... In exceptional circumstances where a member is unable to have their health care completed prior to separation or transfer, approval for post-separation short-term (up to four weeks) health care may be granted...' [para 13]*

The policy appears generous since there is no operational readiness benefit to be received in this case and in contrast, when some other long term treatments are started but not

[53] This process also applies for personnel who have served less than six months and not deployed i.e. the clinical examination is not required unless the form identifies 'significant' health problems (Health Directive 278, Annex D).

completed (e.g. orthodontic[54]), they become the individual's post-separation private responsibility (Health Directive 408). Post-separation care for which there is a Commonwealth responsibility would normally be the purview of DVA.

6.3.3 Dental care

On entry to the ADF, an initial dental assessment is made and a dental classification is allocated as per Table 6.3. Dental treatment is provided for any identified problems and a member's dental classification is reassessed on each presentation for dental services. Health Directive 919 (Reference F) provides recommended access times for non-urgent and preventive dental care. Each year there is an Annual Dental Examination and separating members should have a dental examination within six months prior to separation (including Reserves on continuous full time service Health Directive 284).

Table 6.3: Criteria for dental classifications

Class	Meaning	Amplification	Deployable/ sea duty
1	Fully dentally fit	No treatment planned within the next 12 months plus no active oral disease plus adequate home care	Yes
2	Requires treatment which could be deferred for 12 months	Expected not to present as a dental emergency within the next 12 months. All restorative dentistry is complete. Requires minor preventive therapy e.g. removal of plaque/calculus. Prosthodontic treatment for restorations or prostheses that can be maintained by the member for 12 months.	Yes
3	Requires treatment within 12 months	Restorative dentistry. Prosthodontic treatment for procedures that cannot be maintained by the patient for 12 months. Treatment of moderate to severe periodontal disease. Any complex treatment. Any pathology associated with third molars.	No (a)
4	Requires early treatment	As a guide, 'early' means within approximately one month. Examples are ongoing root canal therapy, deep caries, or insertion of a prosthesis before imminent posting.	No (a)
0	Unclassified	Not yet classified.	No

(a) Waivers may apply. Source: Health Directive 402.

Health Directive 424 notes that the provision of restorative dental therapies occupies the major part (some 70%) of a dental practitioner's clinical time in civilian and ADF settings. However, the cycle of replacement results in a progressive increase in the size, complexity and cost of dental restorations. In recent years, a less interventionist philosophy regarding restorative treatment has been recommended by leaders of the dental profession, advocating more emphasis on disease prevention (e.g. dietary counselling, fluoride therapy, hygienist scale-and-clean to prevent gingivitis and peridontitis) and, where necessary, the use of minimalist restorative techniques. In this vein, in the past wisdom teeth were routinely extracted across all members. These days, the frequency of preventive extractions is reducing, although consultations suggested that potentially there is still an excessive amount of such

[54] Orthodontic and orthognathic treatment is rarely required since the ADF rejects recruits with gross dentofacial impairment, gross malocclusions and similar unsuitable conditions. Occasionally such treatment is required to restore oral health or stabilise a deteriorating situation, but not for cosmetic reasons only.

extractions. Such Minimum Intervention Dentistry principles and protocols are outlined in the Health Directive, which also notes that cosmetic dentistry is not provided by the ADF.

Health Directive 407 provides guidance on the appropriate numbers and composition of dental staff required to deliver dental treatment to the standards described in DI(G) Pers 36–2—*ADF policy on Individual Readiness*, and to maintain an average dental readiness range of above 85% over a 12-month period. The policy recognises that due to regional market forces it may not always be possible to engage less than a full-time staff member.

Table 6.4: Dental officer staff ratios

Care setting	Dependant: Workforce Ratio
Multi-dentist facility	
Full time clinician: Competency Level 2 or equivalent	800:1
Full time clinician: Competency Level 1 or equivalent	640:1
Senior dental officer	20% variance (management duties depend on facility size)
Dental specialist	No guidance
Field-deployable dental facility in garrison	20% less than above (to allow for training/exercise time)
Single dentist facility	10-20% less than above
Induction and training centres	20% less than above (need to undertake comprehensive initial assessments and associated treatment)
Deployed dental teams	1000:1
Dental auxiliary support requirement	
Dental hygienist	1200:1
Dental technician	1600:1
Dental assistant	1 per dental officer
Senior dental assistant	Minimum of one per single-dentist facility (generally replacing a dental assistant)
Dental practice management	1 full-time NCO or equivalent
Additional administrative support	Varies. At a multi-dentist facility, 1600:1 dental assistant assisting practice manager
Dental sterilisation technician	1 per multi-dentist permanent facility with a central sterilising area

Source: Health Directive 407.

6.3.4 Mental health

DI(G) Pers 16-24 outlines mental health care provision in the ADF.

> *ADF members often face the same stressors as those in the general community, such as bereavements, relationship problems, financial difficulties and problematic use of alcohol or other drugs. In addition, aspects of military life create situations that are inherently more stressful than in civilian life (DI(G) Pers 16-24, para 3).*

Examples of additional stressors are more frequent re-locations and trauma from deployments or other violent events. The following Mental Health screens are conducted for ADF personnel.

1. **Return to Australia Psychological Screens (RtAPS)** are conducted for all ADF personnel returning from operational deployments in the area of operations before personnel return to Australia. RtAPS involve an educational briefing (including topics such as potential homecoming readjustment difficulties, remediation strategies and support services), the administration of a screening questionnaire (including measures of post-traumatic stress symptoms, alcohol use, and depressive/anxiety symptoms), and finally a face-to-face interview with a psychologist or trained senior psychological examiner. Any personnel identified as having mental health issues requiring further treatment are referred to appropriate mental health professionals as soon as possible upon return to Australia.

2. **Post Operational Psychological Screens (POPS)** are conducted for all ADF personnel who have returned from operational deployments approximately three to six months after homecoming. POPS involve the administration of a screening questionnaire and an interview with a psychologist or senior psychological examiner. Again, ADF members identified as having significant mental health issues are referred for appropriate treatment/support as required.

3. **Critical Incident Mental Health Support (CIMHS) Screens** are administered to ADF personnel who have been involved in, or exposed to, critical incidents (or potentially traumatic events). The CIMHS screening process typically involves a group educational briefing on the effects of such events, the administration of a screening questionnaire (which includes the Acute Stress Disorder Scale), and a face-to-face interview with a trained mental health professional or mental health provider. ADF members considered to be displaying signs of potentially chronic psychological injuries (e.g. Acute Stress Disorder) are referred to mental health professionals or mental health specialists for more in-depth assessment and treatment (see DI(G) Pers 16-25).

4. **Screening of Special Populations.** Groups of personnel within the ADF who are identified as being at increased risk of mental health difficulties are screened on an as-required basis, usually upon the request of Commanders. Such populations may include Military Police Investigators, Intelligence personnel, and Special Forces (e.g. Special Air Service Regiment). The screening process typically follows the RtAPS and POPS models described above.

Individual mental health care plans are the responsibility of clinical case managers (typically medical officers) and are completed for all ADF personnel assessed as having diagnosable mental health disorders. Care plans for members with less serious, sub-clinical mental health problems may be developed by other mental health professionals, including psychologists and social workers. Care plans should be developed with the input of all involved mental health professionals (e.g. psychologists), specialists (e.g. psychiatrists), and services in accordance with recently released case management policy, Health Directive 289 – Mental Health Case Management in the Australian Defence Force. Health Directives 289 and 260 provide definitions of each category of mental health workforce and flowcharts for protocols, including pathways into the mental health care system (e.g. self-referral, screening, the All Hours Support Line or the military chain of command). In addition, DI(G) Pers 16-26 outlines protocols for managing a suicidal episode and provides information on suicide risk.

Fitness for deployment with a mental health problem or disorder is based on a medical officer's assessment (in consultation with mental health professionals) of deployability, prognosis and MEC (Health Directive 260, para 32). There is currently no tri-service policy on the use of antidepressant medications on deployment although typically personnel taking antidepressants have been medically downgraded such that if they can continue to serve, they have not been allowed to deploy operationally. The Directorate of Mental Health is in the process of submitting a proposal to the Chiefs of Services Committee to allow, under stringent controls and monitoring conditions, the deployment of some personnel taking small maintenance doses of antidepressant medication. Current best-practice guidelines dictate that in order to reduce the risk of relapse, antidepressant treatment should continue for up to twelve months post resolution of symptoms.

Finally, the **Dunt Review** into *Mental Health Care in the ADF and Transition through Discharge* was released in May 2009. Implementation has commenced prior to release, with staff allocated, a comprehensive project plan developed and several major bodies of work commenced.

- **Workforce development** focuses on enhancing current workforce capability and preparing for up to 55 additional direct mental health care positions, plus up to nine further positions in the newly created ADF Centre for Mental Health, and up to ten positions in the Directorate of Mental Health in JHC. Recruitment will be phased over three years.
- **Governance and policy enhancement.** Health Directive 289 was released in April 2009 and addresses the need to improve communication between health professionals identified in the Dunt Review by providing best practice guidelines.
- **Program activity improvement** will include recruitment of single program coordinators. The *Resilience and Prevention Program* continues to refine BattleSMART (Self Management and Resilience Training) for recruits, officer cadets and potentially for ADF members during pre-deployment training. There are also plans to introduce a tailored version of BattleSMART entitled LifeSMART, targeted at transitioning ADF members and their families.
- **Maximising rehabilitation and family engagement in the transition process.** In addition to LifeSMART, the ADF Transition Policy Working Group is examining fundamental elements of the transition process and is liaising with DVA (e.g. regarding the *Keeping in Touch* Workshop). The Directorate of Mental Health is planning a Family Forum to examine how to better engage families with Defence.
- **Research and surveillance.** JHC and CMVH are planning for a Deployment Health Surveillance Program. The CMVH *Health Think Tank report* has been completed and will form the basis of the Mental Health Screening Working Group, meeting in October 2009.

6.4 Rehabilitation and OHS compensation cases

'Rehabilitation is a managed process involving early intervention with appropriate, adequate and timely services based on assessed needs and is aimed at maintaining injured or ill members in, or returning them to suitable employment. Rehabilitation aims to provide assessment and supportive services to facilitate individuals to achieve their maximum potential both physically and vocationally. It is a holistic approach that considers the individuals psychological, physical, social

and vocational circumstances. The rehabilitation process generally incorporates both occupational and medical components' (Health Directive 290:para 3).

The ADF Rehabilitation Program is outlined in DI(G) 16-22 emphasising restoration of functionality, benefits (better health outcomes, productivity, retention of personnel) and the legal setting in OHS and Compensation Acts. Components of the Rehabilitation Program comprise early intervention, rehabilitation assessment and planning, and compensation.

Health Directive 290 outlines current best practice in rehabilitation care, noting that the success of any rehabilitation program requires Command, Defence Health professionals and the Program Case Manager to work closely together towards a common goal identified early on. The longer a member waits for treatment or return to work intervention, the less effective the return to work outcome is likely to be. Rehabilitation triggers and referral processes for care are detailed in Annex A to the Health Directive.

Since the Rehabilitation Program and policy settings are in line with most government OHS and rehabilitation policies, there is little else to add descriptively and no changes suggested in relation to the policy context of this aspect of health care.

6.5 Potential for use of e-technologies or substitute care models

Various e-technologies were explored with a view to potential savings.

- **E-health for ADF members.** The JHC intranet and website www.defence.gov.au/health/ provide access to information for members on health and fitness tips, healthy living information and other featured health topics. The JEHDI personalised health record is discussed in Section 3.
- **E-health to inform workforce, update and standardise best clinical practices.** A new e-health initiative 'Map of Medicine' is being considered which will assist in adapting and modifying clinical processes over time in order to align with new and emerging health technologies, best clinical practice Guidelines (e.g. from the NHMRC), and evidence based models of care.
- **Teleradiology and telepsychiatry.** There are no current teleradiology or telepsychiatry services within garrison.
  - A telemedicine trial is underway in the Middle East but this is very limited in scope.
  - Telepsychiatry is planned as a future function. A business plan has been put forward by the Directorate for Mental Health for telepsychiatry services to be provided to each of the main regional ADF health facilities across Australia. The 'hub' for telepsychiatry services, or the establishment from which psychiatrists and other mental health specialists will operate, is the proposed ADF Centre for Mental Health, which is to be established in Sydney. The telepsychiatry service will provide ADF health facilities with consistent access to specialist clinical assessment, individual and group treatment, clinical supervision, and mental health training services.
- **E-health for screening services.** There is no screening or triage performed via the Internet or web-based system. Mental Health triage is provided through the 1800-All Hours Support Line. The proposed annual mental health screens could potentially be rolled out electronically. At the time of writing, the outcomes from the Mental Health

Screening Working Group October 2009 meeting were unknown. However, population-wide face-to-face mental health screening is unlikely to be cost effective (e.g. Valenstein et al, 2001).

- It is recommended that any large scale initiative such as the proposed policy of annual mental health screening should be subjected to rigorous prospective cost effectiveness analysis and, if prospectively shown to be cost effective, is further evaluated through piloting. The comparator for face-to-face mental health screening should be e-health screening.
- Given that annual mental health screens are not currently budgeted, there are no proposed savings from e-health mental health screening.

6.6 Potential for changed policy

Most current clinical policy settings appear to be working well and should continue, with built-in evaluation to monitor efficacy (health outcomes) and efficiency (cost effectiveness) over time, such as:

- the *Health Promotion Program* in particular most of the specific tests included and excluded from the AHA and CPHE as outlined in Health Directive 242;
- e-health information for members provided through the website;
- best practice evidence that underlies most clinical protocols;
- the shift towards Minimum Intervention Dentistry principles and protocols for access to different types of dental treatment;
- mental health care plans and suicide prevention strategies; and
- rehabilitation and OHS policy.

Some initiatives are recommended to be expedited that have no identifiable budget savings (rather, they may have small costs that can be absorbed within current budget allowances or which will pay for themselves over time) but which have substantial scope to enhance quality of service provision. For example, *Map of Medicine* software is likely to assist with continuous quality improvement in clinical practice. This may in turn reduce adverse event profiles and improve overall health outcomes, which produces savings in terms of health costs for treating adverse events or the poorer health in the 'no change' counterfactual. However, such savings are likely to be relatively small in dollar savings to JHC – though potentially large in terms of QALYs gained or DALYs averted and in productivity gains and personnel cost savings. In addition, *Map of Medicine* may improve efficiency in relation to how continuous quality improvement is currently being achieved (resource-intensive individual reviews).

Similarly, moves towards telepsychiatry are likely to save transport costs for workforce, enhance workforce recruitment and retention by reducing the need for travel, and provide a higher standard of service to rurally and remotely located ADF personnel which would be expected to improve mental health outcomes. Whenever health outcomes are improved, and particularly through early intervention, there are likely to be long term benefits (as noted above) in relation to wellbeing and productivity gains, and reduced long term health or compensation expenditures. However, in the short term there may be capital costs associated with establishing the technology and training and familiarisation costs as it is rolled out. Since the initiative is in such an early phase and the precise model is as yet unknown, this initiative has not been included either in the list of potential savings reform measures.

It is potentially too early also to assess whether there is scope for broader gains from the telemedicine trial currently underway in the Middle East. However, this trial should ideally be evaluated with a view to not just clinical outcomes achieved but also efficiency outcomes, using established cost effectiveness metrics and thresholds.

6.6.1 Screening and examinations

Our review of screening and examination processes revealed close alignment to best practice guidelines – noting that some investigations are no longer undertaken in the ADF due to the evidential basis of lack of efficacy or cost effectiveness (e.g. blood glucose, urinalysis, resting ECG and stress electrocardiography, thyroid function tests, testicular and prostrate cancer tests).[55] However, there are a few areas where reforms could be realised.

1. Bowel cancer screening

Health Directive 242 outlines the current practice of bowel cancer screening using faecal occult blood testing performed every year for both male and female ADF members from 50 years of age. Best practice (such as reviewed in the National Bowel Cancer Screening Program Evaluation) suggests that testing is most cost effective and only required every two years. Australian studies of this issue (O'Leary, 2004; M-TAG, 2004) reflect the same conclusion as United Kingdom and other studies (Whynes et al, 1998; Bolin et al, 1999).

Changing policy on bowel cancer screening to more cost effective frequency would not have large impacts since it is limited to a small ADF population sub-group – permanent force members aged 50 and over. JHC provided data from the 2007 ADF Census for permanent and reserve Navy, Army and Air Force personnel by age group. Reallocating the small proportion (less than 0.5%) whose age was not reported in accordance with the reported age distribution resulted in an estimated 1,564 personnel in 2007 receiving annual bowel cancer screening. This population was assumed to grow at overall Australian population growth rates (as per Section 1.3.2).

The price of a bowel cancer faecal occult blood test and associated pathology was based on historical unit costs from the National Bowel Cancer Screening Program, inflated to current prices based on health inflation (as per Section 1.3.2) – $26.03 in 2009-10. Using these unit costs is potentially conservative, since the average costs of a large scale national program are likely to be the lowest achievable. Only half the screen costs are saved each year (personnel still require a test every two years), and it is recommended the reform measure commence 1/1/10, so estimated savings by year rise from $10,582 in 2009-10 to $30,583 by 2018-19, a total saving of **$246,265 over the ten years.**

2. Timing of health checks

Currently the pre-deployment health checks (see Section 6.3.2) are applicable to all ADF visitors regardless of time in country (Health Directive 222, para 17). For visits less than one week it is recommended that a single health check could replace the four pre-deployment checks and a single check on return could replace the four post-deployment checks. It is also recommended that the post-deployment AHA should (like the POPS) occur 3-6 months after return (rather than at the 3 month mark). Similarly, the final separation health and dental

[55] Health Directive 242, para 28.

checks could occur in the 12 months prior to discharge rather than in the 3-6 months prior, thus enabling a roll-in with the final AHA and annual dental examination and removing duplication (e.g. two tests potentially within a 6-month period).

The numbers of visits less than one week are likely to be small in number and given the absence of data and the potential magnitude for savings, are not costed here.

The realignment of the post-deployment check will still incur a cost, but on average one quarter of the cost will be deferred to the following year. This will occur on an ongoing basis. The modelling assumes (based on consultations) some 5,000 people returning from deployment in 2009-10, increasing each year by the population growth rate to 2018-19. The unit cost is that of an AHA.

Similarly the final Separation Health Assessment will apply to the sub-population of people leaving the ADF each year. Historical separation rates have been around in the order of 10% per annum (or higher) and 10% is used in this analysis. It is also assumed that in any year 5% of separating Reserves are eligible. Together this is estimated as 5,415 members separating in 2009-10, increasing annually at population growth rates. In four fifths of cases the duplication saved would be of an AHA and in one fifth the duplication would be of a CPHE.

Unit costs for AHAs and CPHEs are not available from Defence. It is likely that unit costs are higher than in the civilian population for an equivalent service, but Medicare data have conservatively been used to analyse the average cost of comparable MBS items. Data were available for the year 2007-08 (Table 6.5) and inflated to future years using health cost inflators rates (as per Section 1.3.2). Items considered similar in nature to the CPHE were items 700 and 704, which are similarly comprehensive health checks, while AHAs were considered similar to a 45-year health check of a level 'D' GP consultation (items 717 and 44). Both the AHA and CPHE is conducted based on the results of serology and the full blood count (item 65070) has been used to approximate this cost. The Medicare data represent the full average cost (including gap payments).

Table 6.5: Estimating costs of AHAs and CPHEs from comparable MBS services

MBS item	Descriptor	Average cost 2007-08
700	Health check for Australians aged 75+	$169.95
704	Health check for Indigenous Australians aged 55+	$169.92
717	45-year old health check	$102.63
44	Level 'D' consultation	$102.67
65070	Full blood count	$15.69

Source: Medicare Australia data provided under a special request. Note: Detailed descriptors for each item are available from http://www9.health.gov.au/mbs/search.cfm?q=&sopt=I.

Thus calculated, the average unit cost of the AHA in 2009-10 is $124.32 and of the CPHE is $195.00. In addition, for the same reasons and using the same methods the savings from Separation Dental Assessments can also be realised, with the cost of a dental examination estimated using an average of MBS dental items (85011-87777).

Naturally, for the post-deployment timing reform, most of the savings occur in the first year from commencement (recommended from 1/1/10) - $77,698 in 2009-10 with $173,578 savings in total.

However, the Separation Health and Dental Assessments timing reform (also recommended to commence from 1/1/10) provides ongoing savings from the reduced duplication, estimated as $187,420 (health) and $235,806 (dental) in 2009-10 and $3.883 million (health) and $4.754 million (dental) over the ten year period. Savings from screening reforms are summarised in Table 6.6.

Total estimated savings from screening reforms are 9.06 million over the DFMP.

6.6.2 Readiness requirements for deployment

ADF health policy hinges not just on clinical indication (the focus of Section 6.6 so far) but also on the concept of operational readiness. DI(G) Pers 16-1 (para 5) notes that:

> *'Usually the range of, and ease of access to, health care provided to [Permanent ADF] members will exceed that available through the public health care system because of the requirement to meet and maintain operational readiness. However, DGDHS will, from time to time, issue policy which may exclude or limit the provision of certain medical or dental treatment on the grounds that such treatment is contra-indicated or unnecessary for operational readiness.'*

Hence some health services are provided to Defence personnel purely since they are available to civilians, and even though they may inhibit operational readiness (e.g. in-vitro fertilisation or vasectomy reversal). Some are also refused on the same grounds (e.g. purely cosmetic procedures such as breast implantations, although occasionally exceptions are made). Some other procedures are not supplied on the basis that they should not be required since their indication suggests grounds for potential MEC4 discharge (e.g. gastric banding for extreme morbid obesity).

At any time, not all ADF personnel are likely to deploy nor are all personnel fit to deploy. Although specific recent data were not available, consultations based on previous data suggested some 85% of ADF personnel are fit to deploy based on achieving MEC 1 or MEC2 at any given time. However, even with MEC3 and some MEC4 categorisation, personnel remain part of the ADF.

The readiness requirements are also likely to be less important for those who have never deployed and are not likely to as a result of their particular duties or other factors. For example, Health Directive 285 (para 3) states that for Gap Year personnel, employment on operations is 'unlikely but not impossible'. In such circumstances, health policy needs to consider and reflect actuarial factors. Moreover, some long term maintenance, logistic support or office functions may be considered to require 'standard' rather than 'high' levels of operational readiness. This reality is reflected in the actual rates of overweight and obesity, for example (recall Section 6.1), in some sub-populations.

Optimality rather than totality is also reflected in the JHC strategic plan (e.g. Priority One is to 'Optimise ADF operational health capability' and KPI5 emphasises 'selection of optimum

service delivery models'. Annual screening for young people (under 40) who have a need for standard rather than high levels of operational readiness, particularly given the nature of the checks in the AHA, is unlikely to deliver optimality when cost effectiveness is considered. Similar annual health checks in the civilian population aged 18-39 are not publicly funded nor warranted on the basis of the body of evidence.

Rather, the CPHE delivered every three years is considered more appropriate for this sub-population, replacing the AHA. Ideally the measure should be evaluated and health outcomes compared at baseline and every three years for the two groups. Entitlements to care would still remain the same for both groups ('one ADF') – reduced screening only is recommended. This reform is in line with current policy which recognises that health status and services simply need to be 'fit for purpose' (recall KPIs 3 and 5 in Table 1.1).

Services are likely to be best informed in relation to which employment positions genuinely require high levels of operational readiness in terms of screening and which require standard levels. It is recommended that targets are set and such determinations are considered by Services, with a view to defining 50% of those younger than 40 years in each screening requirement group. Due to the need for this identification and consideration process, it is recommended that the reform commence 1 July 2010 rather than 1 January 2010 when the screening reforms could commence.

There are an estimated 43,911 permanent forces aged under 40 in 2009-10, increasing with population growth each year. Unit cost savings per annum are estimated as the weighted average of current screening costs, minus one third of the cost of triennial CPME, minus an allowance for one extra doctor visit (over and above normal visits) in order to treat any specific health problem that may arise over the triennium. The extra doctor visit is based on a standard Item 23 (Level 'B') general practice appointment under Medicare. Thus: (0.8*124.32+0.2*195.00)-(195.00/3)-39.11 = $36.22 in 2009-10, increasing with health inflation (see Table 6.6).

Savings from standard health assessments would be zero in 2009-10 but $832,496 in 2010-11 and $8.857 million over the DMFP horizon.

It is also recommended that post-separation health care should be discontinued – however, data were not available to estimate the cost savings and since they are likely to be small they have not been included in this costing.

6.6.3 Co-contributions

The principle of equivalence with Medicare and the public health system neglects an important attribute of health services provided to civilians – civilians face out of pocket costs. While vested interests might claim that zero marginal costs for health care are an 'entitlement', this is not evident from review of the legislation or policy undertaken in this analysis.

AIHW (2009) shows that of total health expenditure in 2007-08 in Australia ($103.6 million) individuals funded $17.4 billion in out of pocket costs and a further $7.9 billion via premium payments to private health insurance (PHI) providers. Of total per capita recurrent health expenditure of $4,613 per person in 2007-08, civilians funded $1,126 (24%) themselves. Even within the MBS, where all items are listed in principle on the basis of clinical need, individuals

contributed some $3.42 billion of the $16.0 billion (21%) in 2007-08. For some 279 million services, this represented an individual co-contribution of $12.27 per MBS service (with an average of around 13 MBS services billed each year per Australian, on average). On the MBS alone then, civilians pay around $162.89 per year for their health entitlement.

It is recommended that ADF personnel also make a – much smaller – co-contribution to the provision of their health care. A suggested contribution equivalent to $12.27 per annum is recommended. This equates to 8% of what a civilian would pay for their annual MBS services on average or around 1% of what a civilian pays each year for a lower standard of health care.

Ideally co-contributions occur at the point of service, so that the marginal cost provides sound incentives to consider service utilisation. This is in line with other Government policy – for example, co-contributions to PBS-subsidised pharmaceuticals and for other services – with caps or safety nets. Since the detail of the payment of the co-contribution is likely to be much less of an issue than its introduction or overall level, for the purpose of this costing only the recommended annual amount has been included. The amount is so small relative to disposable income that no behavioural change is expected in terms of the number of health services accessed, even if payments are made at the margin. $1 per health service is estimated to be adequate, given the expectation of an average of at least the 13 MBS services on average provided per civilian per annum.

The $12.27 unit cost is increased each year in line with health inflation (see Table 6.6). The reform is able to be implemented from 1/1/10 so the full amount of savings each year could accrue.

> Savings from co-contributions would be $902,389 in 2009-10 and $10.952 million over the DMFP horizon.

6.7 Summary of model findings

A summary of cost savings is provided in Table 6.6 – with $27.75 million in savings realised over the DFMP from KRMS measures.

Table 6.6: Budget impact of policy review and rationalisation (nominal $)

Description	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total
5.1 Bowel cancer biennial screen 50+											
Persons (permanent forces aged 50+)	1,626	1,647	1,668	1,689	1,710	1,731	1,753	1,774	1,795	1,817	
Unit cost of FOBT and pathology ($)	26.03	26.90	27.80	28.60	29.29	29.98	30.84	31.80	32.73	33.67	
Savings ($)	**10,582***	**22,152**	**23,188**	**24,158**	**25,047**	**25,950**	**27,021**	**28,207**	**29,377**	**30,583**	**246,265**
5.2 Post-deployment AHA timing											
People deployed (pa estimate)	5,000	5,064	5,129	5,193	5,258	5,323	5,388	5,454	5,519	5,585	
Savings ($)	**77,698**	**79,693**	**1,999**	**2,004**	**2,011**	**2,020**	**2,030**	**2,036**	**2,042**	**2,045**	**173,578**
5.3 Final separation check timing											
Separations (10% pa)	5,415	5,484	5,554	5,624	5,694	5,764	5,835	5,906	5,977	6,048	
a. Savings separation health ($)	**187,420***	**392,354**	**397,398**	**400,568**	**403,637**	**408,359**	**415,510**	**421,658**	**425,792**	**430,760**	**3,883,455**
b. Savings separation dental ($)	**235,806***	**477,667**	**483,733**	**489,814**	**495,918**	**502,049**	**508,211**	**514,391**	**520,588**	**526,794**	**4,754,971**
Total screening savings	**511,505**	**971,867**	**906,317**	**916,544**	**926,614**	**938,378**	**952,772**	**966,293**	**977,798**	**990,182**	**9,058,269**
5.4 Standard health assessments											
Persons (permanent forces aged <40)	43,911	44,475	45,040	45,606	46,174	46,745	47,319	47,894	48,471	49,049	
Unit cost saving ($)	36.22	37.44	38.69	39.81	40.77	41.72	42.92	44.27	45.55	46.86	
Total standardisation savings ($)	**0****	**832,496**	**871,405**	**907,880**	**941,296**	**975,206**	**1,015,476**	**1,060,045**	**1,103,992**	**1,149,331**	**8,857,126**
5.5 Co-contributions											
Persons (permanent forces)	73,527	74,471	75,417	76,365	77,317	78,273	79,233	80,197	81,163	82,131	
Average co-contribution pa ($)	12.27	12.68	13.11	13.49	13.81	14.14	14.54	15.00	15.43	15.88	
Total co-contribution savings ($)	**902,389**	**944,552**	**988,697**	**1,030,082**	**1,067,996**	**1,106,470**	**1,152,161**	**1,202,729**	**1,252,591**	**1,304,033**	**10,951,700**
If 5.3 and 5.4 both implemented ($)	-53,692	-112,401	-113,846	-114,754	-115,634	-116,986	-119,035	-120,796	-121,980	-123,404	-1,112,529
Total net savings from policy review ($)	**1,360,203**	**2,636,513**	**2,652,573**	**2,739,751**	**2,820,272**	**2,903,067**	**3,001,375**	**3,108,270**	**3,212,401**	**3,320,142**	**27,754,567**

Source: Access Economics. Note: Includes capital and recurrent expenditure items. * Half year – reform could commence 1/1/10. ** Reform could only commence 1/7/10.

Note that if 5.3 and 5.4 are both implemented, the full extent of savings from modifying the timing of the separation health assessment would not accrue.

6.8 Key risks – policy review and rationalisation

Risks identified by JHC in relation to the policy review and rationalisation KRM were:

- a suitable e-health policy solution cannot be identified or deployed; and
- operational readiness policy requirements will need review.

The first risk above is not an immediate risk, since the reforms do not at this stage require e-health components. At this stage, the body of evidence does not support additional annual mental health screening (e.g. Valenstein et al, 2001).

The second risk above is an important one and potential risk mitigation strategies include:

- Careful communication strategies which emphasis that:
  - proposed reforms are directed towards reducing costs without compromising outcomes by identifying areas where expenditure on inputs is not in fact generating improved outcomes;
  - proposed reforms are evidence based;
  - standardisation will not create a 'two-tier' ADF but simply supply health screening services based on the principle of being 'fit for purpose' – there will still be equal access to care services;
  - ADF personnel are entitled to health services on the basis of equivalence with Medicare – as for civilians this guarantees access but not 100% Government payment for services that meet recognised needs;
  - like Medicare, some co-contribution is imperative since zero cost encourages over-utilisation in the long term;
  - the proposed co-contribution represents less than 1% of civilian co-contributions for lower quality services.
- Communication strategies should commence with VCDF and CFO.

The financial impact of risks is modelled in Section 9.2, with an emphasis on:

- higher and lower unit costs for AHAs, CPHEs and dental checks;
- no conversion to 3-yearly health checks or 100% conversion (the latter may be a compromise position to achieve 'one ADF' due to political feasibility); and
- no co-contribution as well as the possibility (if a single $1 charge per health service is introduced) that in fact more than 12.83 services are averaged per member per annum.

7 Industry partnering and strategic alliances

This chapter reviews the scope for the ADF to enter into new strategic alliances. Specific tasks were to:

1. identify potential partnerships and alliances (including [redacted] Sydney and possibilities in Queensland and Victoria) and determine the nature of benefits that could be derived from each such as:
   - training for ADF personnel;
   - research and development opportunities;
   - alternative delivery models for fee for service health care that could reduce costs;
   - potential revenue streams from use of spare capacity at ADF facilities; and/or
   - a reduction in the number of ADF facilities required;
2. model the overall cost and savings impact for each partnership/alliance and summarise the findings (cementing the partnership/alliance was out of scope).

7.1 Methodological approach

- The first task was to identify potential partnerships and alliances (including [redacted] Sydney and possibilities in Queensland and Victoria) and determine the nature of benefits that could be derived from each such as: training for ADF personnel; research and development opportunities; alternative delivery models for fee for service health care that could reduce costs; potential revenue streams from use of spare capacity at ADF facilities; and/or a reduction in the number of ADF facilities required.
  - Background information was requested on the establishment of the [redacted] partnership agreement, the nature of the relationship currently and whether any evaluation had been undertaken previously of this partnership or if there were any 'before and after' data available on services, workforce/patient satisfaction and outcomes. In the absence of such data, these issues were discussed with partnership contacts including the nature, extent and value of perceived benefits from the partnership arrangement relative to the historical 'base case' alternative. This also included the nature and value of benefits for partner organisations and their rationale for forming the alliance. The translatability of the Sydney experience to other locations was reviewed as well as the scope for taking advantage of economies of scale elsewhere.
  - In particular, scope for comparable benefits was reviewed in relation to the similar current proposals for partnership being explored in Queensland and Victoria. Discussions were requested with an ADF health workforce contact at each of the three locations to ascertain the potential training and R&D opportunities that were perceived could better align and hone skills and knowledge to those required operationally and could provide intellectual stimulation that may assist with retention. Alternatively, partnership arrangements may increase the chances of losing personnel to the partner organisation. Where the partnership has already occurred (Sydney) the experience in terms of training, R&D opportunities and retention was discussed.
  - We requested information from JHC on the scope for competency-based payscales (e.g. anaesthesia competencies, tropical/underwater medicine, surgery

competencies) rather than current practice e.g. full FRACGP requirements which determine payscales (current practice may provide incentives for getting but not necessarily using particular qualifications, and may disincentivise training/CME in unrewarded but useful competencies). The project plan indicated there may be scope to explore alliances with other medical colleges in order to access accreditation for training modules only – however, due to time constraints, no information was provided in this area and in any case there was considered to be a low probability of changes to training models generating SRP savings of any magnitude. Hence, this additional scope was not pursued.

- We requested information on where there currently is any underutilised capacity at ADF facilities that has the potential to provide revenue streams from outsourcing. While this issue was largely addressed in KRM 4, an additional aspect is that dependant:doctor ratios are lower in the military than in the general population. We reviewed if and where this has occurred historically (with medical or other health services) and the outcomes, in particular any cost impacts.
- We also requested information on how purchasing power may have been improved in recent years through use of strategic partnering and the JHC view on opportunities in this area going forward, bearing in mind the nature any opportunities that have already been explored or are currently in the process of being explored. However, no written information was provided.
- In the Project Plan we sought to review how DVA has undertaken its strategic purchasing of services and with what success and efficiencies. Ideally we desired to talk to a contact at DVA about this and access DVA data on price/service – particular in relation to medical, surgical and psychiatric services, pathology/imaging, rehabilitation and pharmaceuticals. However, again time constraints for permission and other processes prevented this so we were limited in our ability to explore the DVA approach. Alliances with other health service purchasers (e.g. PHI companies as per Key Reform Measure 4) were also explored. This is also in keeping with NHHRC 'health plan' concepts.

- Finally, having assimilated the input information from the process outlined above the overall cost and savings impact for each partnership/alliance was modelled in Excel by year and findings summarised in relation to the 10-year period for:
  - any potential changes to partnership arrangements in Sydney;
  - potential partnership arrangements in Victoria and Queensland;
  - any identified potential revenue streams from underutilised capacity;
  - potential changes to training protocols; and from
  - strategic purchasing and alliances with other service purchasers.

7.2 [redacted]

[redacted]

Full page redactions

Full page redactions

7.3 Partnerships and alliances at other sites

[redacted]

- Consideration is also being given to potential alliance arrangements in Victoria. So far this is at the exploratory stage only.

7.4 Potential for cost savings from translating partnerships/ alliances

[redacted]

There is also scope to achieve savings in future from changing the medical structure. It was through that the savings 'may not be in the SRP league' but may be in the order of saving 1FTE doctor per annum (e.g. via conversion of contracted services to a salaried position when the current contract expires). While contract conversions have already been included in KRM3 calculations, since the nature of the savings gain might also be through the provision of a uniformed medical officer to save contract costs, it would represent an additional savings to JHC.

From the KRM3 calculations, the average of the APS remuneration being offered to contract doctors plus on-costs was $217,963. While some existing APS doctors are receiving lower remuneration than this, and most existing contractors are receiving more, this average 'conversion' remuneration is probably a fair proxy for the marginal position. As such it is included in the potential savings and assumed to commence in 2011-12.

7.5 Workload

From analysis of rate of effort data, it was observed that the ratio of dependants to health service providers was relatively low. In some areas the ratio of dependants to doctors, for example, was around 400:1, whereas in the civilian community the ratio is around 1000:1 on average for GPs (higher for specialist doctors). Consultations suggested that target ratios are set by some services. For example, the army allows one doctor per rifle battalion (750 men). This is based on war conditions (high casualties).

In dentistry, target dependant:dentist ratios are stipulated (recall Table 6.4) with a maximum ratio of 800:1. It was not clear how these targets translate into practice i.e. what the actual ratios are. However, rates of 800:1 are lower than for civilians, again noting that a higher standard of care is required in the ADF.

In some areas, workforce is 'lumpy' – particularly for small bases in rural and remote locations, where only a full time position if able to be filled, but a part-time position is all that is required. An option here is the scope for ADF personnel to provide services to civilians on a fee-for-service basis, especially in areas where alternative health service providers are scarce (not least after hours).

Consultations suggested that undercapacity may be an issue in recruitment and retention also. Small amounts of routine, less challenging work ('coughs, colds and sore holes') may be

addressed through increasing workload by outselling services on a case-by case basis, such as in the small-remote-facility example above.

The question remains as to what is the 'right' ratio. While the civilian average (e.g. 1000:1 for GPs) may be too high, given higher required standards of care, ratios of 400:1 are likely to be too low.

A civilian FTE GP might see three patients per hour for 8 hours per day, 5 days per week and 44 weeks per year (allowing for holidays, public holidays, sick days and continuing medical education). This would be 5,280 patients per annum or 5.2 visits per patient per annum on average (with 1000:1 ratio). With 400 patients per annum, the ADF doctor would see only 1.2 rather than 3 patients per hour i.e. 50 minute consultations rather than 20 minute consultations on average, or work fewer hours overall. Given younger age and lower levels of complex comorbidity, it is not clear why such long consultations would be warranted.

In effect however, the gradual conversion of doctors to nurse practitioners and physician assistants in KRM3 will reduce dependant:doctor ratios, so to estimate potential savings again in this setting would be to risk double counting. In the meantime, it is recommended that FTE provider:dependant ratios are measured and centrally reported across facilities as an important KPI (including ADF, APS and contractor providers).

7.6 Summary of model findings

No potential additional savings – over and above those already counted in other KRMs – were identified at this stage in terms of potential revenue streams from underutilised capacity (e.g. dependant-doctor ratios), potential changes to training protocols; or from strategic purchasing and alliances with other service purchasers (as per KRM4).

Table 7.2: Budget impact of industry partnering and strategic alliances (nominal $)

Description	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total
Net savings Sydney			[redacted]								
Net savings Queensland					[redacted]						
Net savings Victoria (scoping)							[redacted]				
Total net savings from strategic alliances					490,639	502,108	774,754	799,040	822,261	845,944	4,707,132

Source: Access Economics. Note: Includes capital and recurrent expenditure items.

9.2 Sensitivity analysis on the proposed reforms

Risk assessments are provided below in relation to costing the KRMs, since the modelling depends on a number of assumptions.

- Sensitivity analysis has been conducted using @Risk software. @Risk is a simple software program that draws a random number for each major input parameter (e.g. percentage saving on a contract overhead) from its distribution function (e.g. normal, right-tailed, triangular, discrete) and recalculates the major output parameter (in this case costs or savings overall). This process is repeated many times (say, 10,000) to estimate worst case and best case scenarios or the range of confidence intervals (say, 90%).

In line with conventional actuarial risk assessment techniques, parameters considered most uncertain and with greatest potential to change overall outcomes were subjected to sensitivity analysis. Up to five main parameters for each KRM are summarised in Table 9.2.

Table 9.2: Parameters for sensitivity analysis - settings and distribution

	Base case value	High savings	Low savings	Distribution
KRM1				
Annual building operating expenses per sq m ($)	$100	150% ($150)	50% ($50)	Normal
KRM2	-	-	-	-
KRM3				
Proportion cheaper contractors willing to join APS	2/3	125% (5/6 of contractors willing to join APS)	75% (1/2 of contractors willing to join APS)	Normal
Time to fill PA/NP positions	2 years	150% (PA/NP positions filled in 1 year)	50% (PA/NP positions filled in 4 years)	Normal
KRM4				
Rates of referral to diagnostic imaging	75%	75% (56% of referrals to diagnostic imaging)	125% (94% of referrals to diagnostic imaging)	Normal
Surgery referrals per garrison population	15.5%	125% (19% of referrals per garrison population)	75% (12% of referrals per garrison population)	Normal
KRM5				
Unit costs	*Basis: MBS*	*Defence found to be 2.76 times higher (Ramsay)*	*MBS items may not match/ may overstate*	

Table 9.1: Summary of budget impacts of all SRP measures (nominal $)

Description	9-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	Total
KRM1 Rationalisation of facilities	0.0	-3.3	-6.3	-3.8	1.8	6.7	7.3	7.5	7.7	7.9	25.5
KRM 2 JEHDI	-	-	-	-	-	-	-	-	-	-	-
KRM 3 Integrated health workforce	3.6	7.4	8.9	9.2	9.6	10.0	10.4	10.8	11.2	11.6	92.5
KRM 4 Multidisciplinary primary health care	2.5	2.6	2.7	2.7	2.8	2.9	3.0	3.1	3.1	3.2	28.6
KRM 5 Policy review/rationalisation	1.4	2.6	2.7	2.7	2.8	2.9	3.0	3.1	3.2	3.3	27.8
KRM 6 Industry partnering/ alliances	0.0	0.0	0.2	0.2	0.5	0.5	0.8	0.8	0.8	0.8	4.7
Net savings 6 KRMs	7.4	9.3	8.1	11.1	17.5	23.0	24.4	25.2	26.1	26.9	179.1

Source: Access Economics. Note: Includes capital and recurrent expenditure items.

- (5.5) reflecting the principle of equivalence with Medicare, introducing a small (around 1% of the civilian amount) co-contribution of $12.27 per annum (for 2009-10, indexed to health inflation over time), ideally spread over services so as to represent a small incremental cost, generating savings of $10.95 million over the DFMP.

KRM 6 achieves $4.7 million in savings over the DFMP through industry partnering and strategic alliances comprising:

- [redacted]
- [redacted]

A summary of findings is presented in Table 9.1.

9 Summary and risk analysis

This chapter provides a birds-eye view of the six proposed KRMs and their financial impacts (Section 9.1), assesses the sensitivity of the results for each KRM to changes in key assumptions (Section9.2) and provides a risk analysis of the budget overall (Section 9.3).

9.1 Summary of the six proposed KRMs

KRM 1 analyses the rationalisation of facilities primarily through hubbing. Key benefits comprise savings from removing the need to maintain facilities and equipment, and potential gains from staffing consolidation. However, these gains overlap with other KRMs – notably KRM3 and KRM4 below. The total additional savings from KRM1 are estimated at $25.5 million.

KRM 2 While the Joint e-Health Data and Information (JEHDI) should prove highly useful for management and epidemiological purposes, given its early inception stage, Access Economics does not consider that it is feasible to model such savings at this time.

KRM 3 Integrated health workforce, achieves total savings of $92.5 million through converting contract health workers to APS positions (a saving of $35.7 million) and through using physician assistants (PAs) (a saving of $56.9 million).

KRM 4 Multidisciplinary primary health care, potentially achieves total savings of $27.8m, primarily from the closure of imaging and operating theatre facilities on garrisons.

- Based on a case mix model derived from the agreement for the provision of health service to the Albury Wodonga Military Area (AWMA), there are potential savings of $15.9 million from the closure of operational diagnostic imaging facilities and outsourcing ADF needs on a fee-for-service basis.
- Based on data from the Duntroon Health Centre and RAAF Edinburgh and use a cost-per-procedure analysis, closure of the remaining operating theatres and outsourcing surgical procedures to civilian hospitals may generate up to $12.8 million in savings.

KRM 5 achieves $27.8 million in savings over the DFMP through policy review and rationalisation measures comprising:

- screening reforms from 1/1/10 providing savings of 9.1 million which include:
  - (5.1) bowel cancer screening for members aged 50 years and over biennially rather than annually; and
  - (5.2) bringing the timing of post-deployment AHAs in line with those for mental health screening (3-6 months); and
  - (5.3) allowing final Separation Health and Dental Assessments to occur in the 12 months prior to discharge rather than in the 3-6 months prior, thus removing potential duplication (e.g. two tests potentially within a 6-month period);
- (5.4) from 1/7/10, providing a 'standard' regime of health assessments for half of ADF members aged up to 40 – namely a CPHE every three years and allowing for an additional mid-triennium health visit rather than AHAs – reflecting that health service provision should be in line with being 'fit for purpose' ($8.86 million); and

8 Other potential reform areas

No other potential reform areas were identified at this stage and, given the six KRMs have achieved the SRP targets, none were sought given time constraints.

7.7 Key risks – proposed partnering and alliances

Risks identified by JHC in relation to the policy review and rationalisation KRM were:

- Unable to develop a sufficiently attractive package to recruit specialists.
- Legal and contracting impediments.

Both of these risks would likely manifest as delays to the timing of realising savings, and have been modelled as such in the sensitivity analysis in Chapter 9.

Risk mitigation strategies comprise ensuring personnel with excellent project management skills and high levels of initiative and drive are responsible for overseeing the partnership arrangements in each location.

	Base case value	High savings	Low savings	Distribution
AHA	124.32	150%	50%	Normal
CPHE	195.00	150%	50%	Normal
Dental visit	174.20	150%	50%	Normal
Policy decisions	*Basis: reasonable & achievable*	*Different for each – see below*	*May be rejected (political sensitivity)*	*Each outcome considered equally likely*
%<40 'standard'	50%	100%. Compromise change policy for all.	0	Discrete
Copayment	$12.27	$15. If incremental $1/ service, may be >13 services	0	Discrete
KRM6				
Timing	*Basis: reasonable & achievable*	Could achieve 1 year earlier	Could achieve 1 year later	
	11-12, 13-14, 15-16	Bring forward 1 year	Delay 1 year	Normal

Source: Access Economics.

Findings from the sensitivity analysis are presented in Table 9.3 for the total savings over the ten years of the DFMP. Individual years are only reported in total here (i.e. for all KRMs).

Table 9.3: Findings from sensitivity analysis – individual parameter variance ($ million)

	Base case value	High savings	Low savings
KRM1	25.5	+4.0	-4.0
KRM2	-	-	-
KRM3	92.5	+11.4	-14.1
KRM4	28.6	+7.8	-11.1
KRM5	27.8	+33.10	-23.7
KRM6	4.71	+0.73	-0.74
Total	**179.1**	**+57.0**	**-53.6**

Source: Access Economics.

KRM1: The savings generated from rationalisation of facilities depend in part on their operating cost. Available estimates of operating costs for health centres (per square meter) vary greatly. A normal distribution has been assumed with a high savings option (based on 50% higher operating costs) and a low savings option (based on 50% lower operating costs).

KRM2: Not applicable. No sensitivity analysis conducted.

KRM3: If greater numbers of contractors are converted to APS positions greater savings will be achieved. Conversely, if there are delays in introducing the PAs and NPs opportunities for significant savings may be lost.

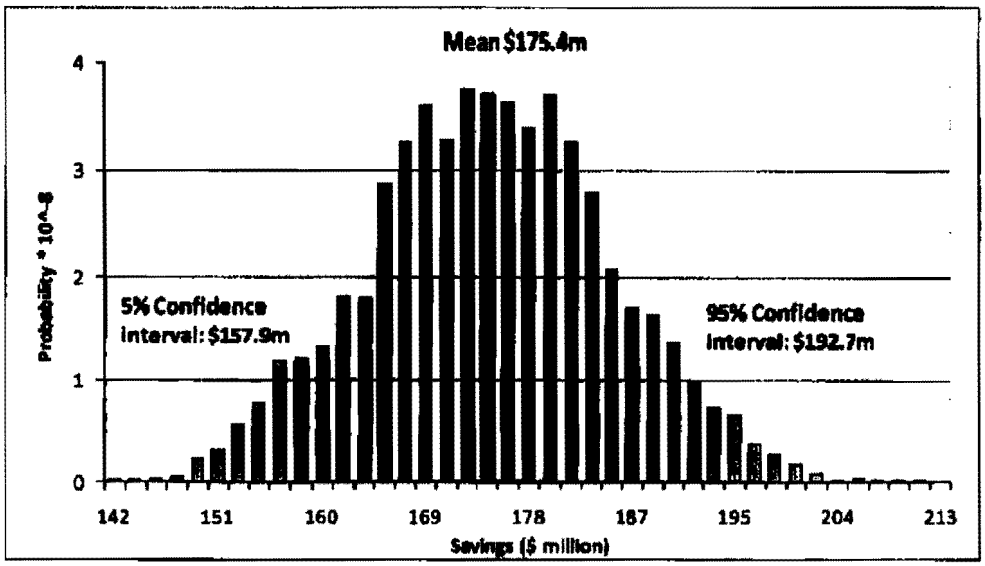
KRM4: Lower rates of referral to diagnostic imaging lead to lower overall costs and therefore increased savings (and vice versa). On the other hand, higher rates of surgery referrals per garrison population result in higher savings because a significant proportion of the services are conducted in house.

KRM5: As expected, there are greater savings if the unit cost of the AHA and the dental visit are higher than in the base case but, somewhat counter-intuitively, losses if the unit cost of the CPHE is higher than in the base case. This is because the standardisation reform switches annual to three-yearly health checks so the outcome reflects the relative differential in price if the CPHE unit cost is increased without a commensurate increase in the AHA. In reality it is likely that if the CPHE unit cost has been underestimated, so has the AHA unit cost – hence the simultaneous change of these parameters is more reflective of the real world (simultaneous change is reported below). The potential impacts of quite high probability events are substantial (e.g. not achieving co-contributions jeopardises $11.0 million of $27.8 million in SRP savings).

For KRM 6, changing the timing by one year changes outcomes by less than $1 million over the DFMP, with a slight asymmetry due to values in nominal dollars.

The next step is to use the @ Risk software package to analyse the overall distribution of the savings by changing all parameters simultaneously to their distribution function as outlined in Chart 9.1. The results are reported in Chart 9.1 below, which shows that the expected value of the total net savings is $175.4 million. In addition, there is a 90% likelihood that total savings will be between $157.9 million and $192.7 million. This compares favourably with the target savings of $118 million and is broadly consistent with the univariate sensitivity analysis carried out in Table 9.1 to 9.3 above.

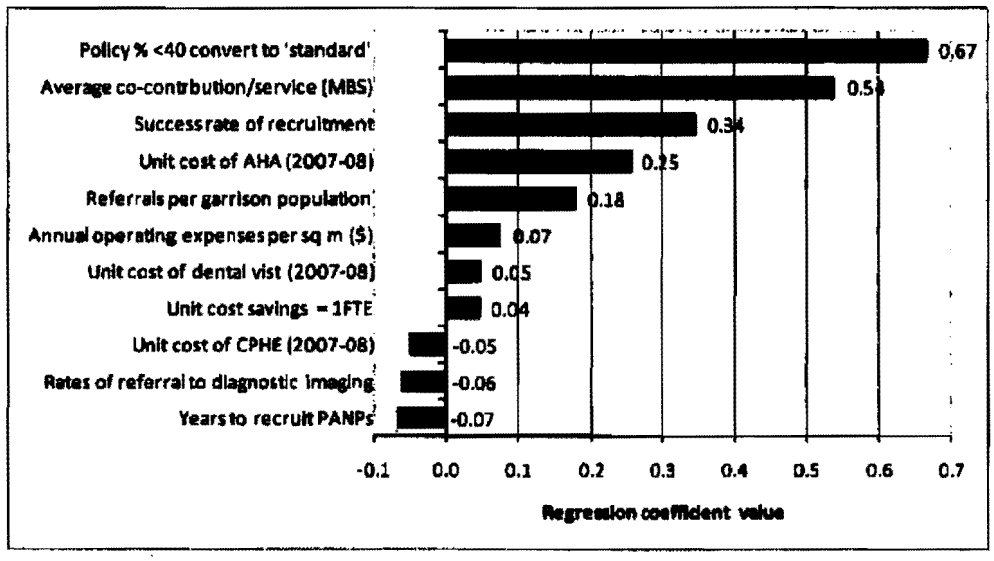
Chart 9.1: Probability distribution of savings outcomes using @ Risk



It is also possible to examine the drivers of variation in expected savings. Chart 9.2 below is a tornado graph. Tornado graphs from a sensitivity analysis display a ranking of the input distributions which impact an output. The values on the X-axis of this tornado graph type show the amount of change in the output due to a +1 standard deviation change in each input.

Chart 9.2 shows that net savings are most sensitive to changes in how many people aged under 40 have less frequent health assessments; the amount of co-contribution (if any); and success in converting contractors to APS positions.

Chart 9.2: Regression and rank of net savings in KRMs



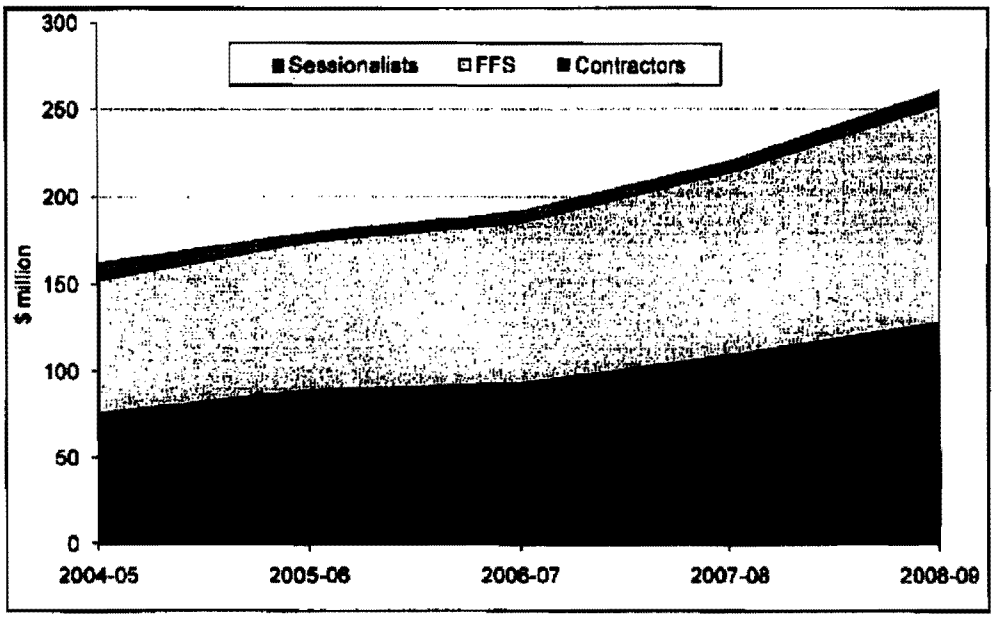
9.3 Risk analysis for the overall budget

This section provides an overall analysis of the main sources of JHC budget risk. Particular budget items are reviewed including historical time series in order to more closely identify over-runs, high growth items, and future overall risk-contingency profiles.

The focus is on the MEE Budget as this constitutes the bulk of total defence health and is the area targeted for savings (Chart 9.3).

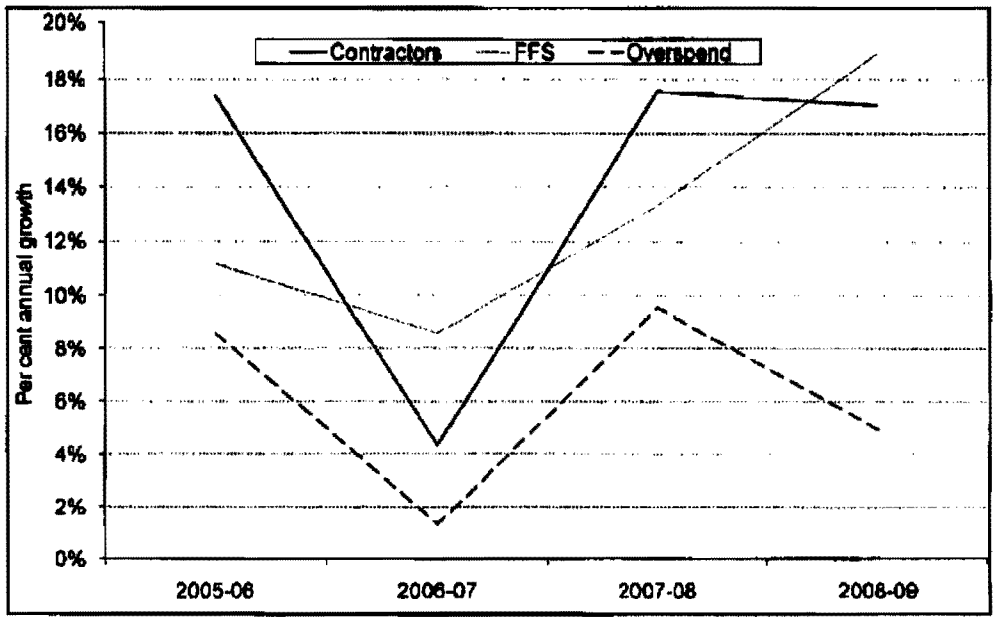
The major components of the MEE budget are: Contractors (comprising 49.1% of MEE spending in 2008-09); Fee for Service providers (47.9% of MEE spending in 2008-09). Finally, sessionalists expenditure accounts for a relatively minor 3.0% in 2008-09).

Chart 9.3: Components of MEE spending



Historically defence health has had significant overspends, for example 18% in 2004-05 and an average of 9% over the last 5 years – when comparing the overspend against the allocated MEE budget expenditure.

Chart 9.4: Growth in major components of MEE spending and total overspend



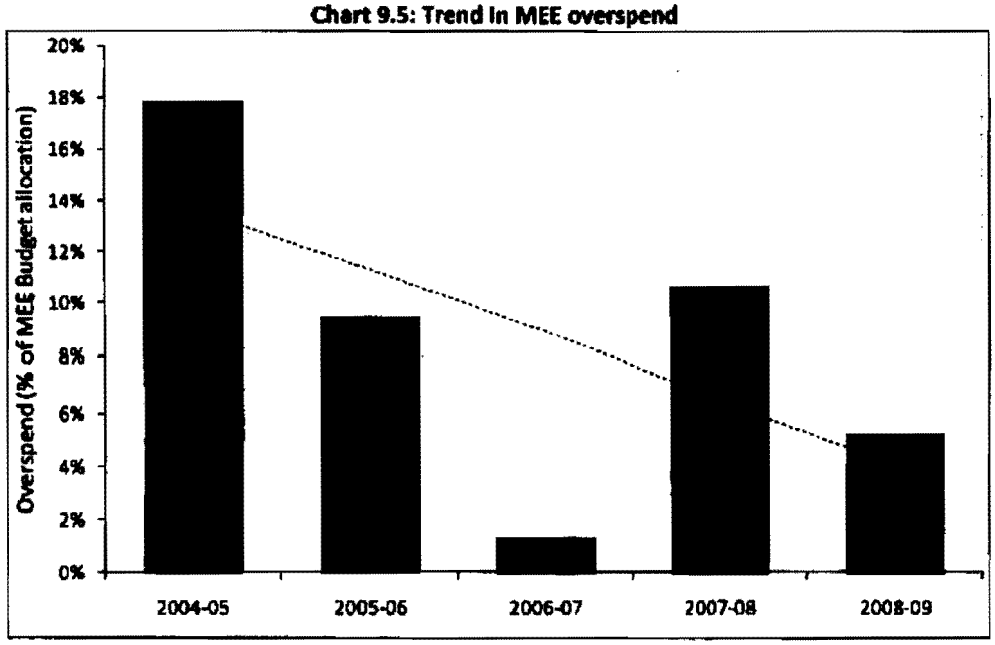
The main risk to budget overspends appears to be contractors. Historical data indicate that variations in growth of contractor expenditure is correlated with growth in total MEE overspend (Chart 9.4).

If the Access Economics recommendations of converting contractors to APS staff are implemented this would help to reduce this element of budget overspend risk as APS are both less expensive and less prone to fluctuations in staff numbers.

Further, the command structure of defence health has now been reformed and is under a single Joint Health Command (JHC). This should give JHC the ability to oversee expenditure and implement savings initiatives. The implementation of the SRP gives JHC a strong incentive to control health expenditure growth. This can perhaps be seen in the declining overspend in recent years (Chart 9.5).

In future it is expected that there will be tighter controls of the use of locums (when military doctors go on operations) as health centres will need to obtain permission from area directors for such expenditures.

Chart 9.5: Trend in MEE overspend



Another possible risk to the overall defence health budget is indexation. Access Economics is uncertain on what basis the forward budget for JHC has been allocated (i.e. to the year 2019). Our understanding is that in 2001 health expenditure was given its own index (possibly based on AIHW data). However, this index only applied for 10 years, whereupon it reverts to the standard index used across all Defence spending. This represents a significant budget risk as the current index is around 8% per annum whereas the non-farm GDP is expected to be around 3% over the next decade.

Finally, JEHDI represents both opportunities and threats for the defence health budget. Historically, both defence IT projects and civilian e-health projects have been characterised by both cost and time overruns. However, the JEHDI budget is relatively small (around $50

million over the forward estimates). On the other hand, the potential savings are significant – if uncertain. Most hospitals which have implemented e-health systems have already known both what activities they undertake and how efficiently they carry them out prior to implementation. E-health has simply enabled them to improve that. In the case of defence, potentially the largest benefit from JEHDI is enabling JHC to get to first principles – that is, knowing what activities and services they provide and how efficiently they do so. JEHDI should therefore enable identification of unnecessary and unproductive spending.

10 Conclusions

It is critical for JHC efficiency going forward that measuring health outcomes becomes embedded in policy and practice. In other government departments, such as the Department of Health and Ageing and state and territory health departments, there is growing utilisation of cost effectiveness analysis in order to achieve efficiency objectives. Cost effectiveness analysis and cost benefit analysis should become central to JHC service provision in line with the JHC Strategic Plan objective for cost effective and efficient service. Where it is not possible to provide such analysis, marginal analysis (such as used in this report) should be undertaken – i.e. analysis at the margin to determine where strategic health objectives can continue to be achieved for lower cost.

Although financial accountability has improved over the past 12-18 months, it is recognised there is still some way to go to achieve ideals such as full cost allocation, so that efficiency of health service provision can be tracked over time and compared across locations and health service types, such as occurs for public hospitals for example (where it is possible to make casemix comparisons and funding arrangements can be based on activity based costings).

Another key issue identified during this analysis was the difficulty of managing expectations for health services. This problem is evident outside the ADF – civilian Australians facing zero marginal costs also have incentives to expect service regardless of cost. As well as the copayment measures suggested in KRM5, it is also recommended that clarification and communication processes are commenced that clearly delineate and inform ADF personnel in relation to entitlements (which expectations can be realised and which cannot and why), access (types of services and timing of access in various locations/situations), and duty of care issues (particularly to clarify chain of command issues between JHC and commanding officers).

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