Cost Resource Manual Version 3

October 2018

Introduction

This manual is intended to promote consistency in the costs and prices used in health technology assessments by and for PHARMAC. It was first published in 2012.

Current data on key costs and prices that PHARMAC regularly uses in cost-utility analyses (CUAs) and budget impact analyses (BIAs) are listed, so that applications for funding can use the same data as PHARMAC does in its own economic assessments.

The *Cost Resource Manual* supplements the *Prescription for Pharmacoeconomic Analysis* (PFPA), published at www.pharmac.govt.nz/pfpa. The PFPA gives more detail on the scope of costs that PHARMAC considers in technology assessments, and how and when to include different categories of costs in health economic models.

Table 1: Key costs by category

Cost	Details
Pharmaceutical	Community and hospital pharmaceuticals Pharmacy fees Pharmaceutical administration Pharmacy costs to patients
Primary health care	General practitioner or practice nurse visits
Investigative and diagnostic tests	Diagnostic imaging Pathology tests
Hospital care	Hospital inpatient care Hospital outpatient care (specialist appointments and emergency room visits) Travel and accommodation
Community health services	Palliative care Residential care In-home nursing, personal care and home help Prenatal and postnatal care Disability support services Ambulance

Costs, prices and sources

This Manual does not include all costs that may be required for an economic analysis, but rather it lists the key prices that are commonly used in assessments at PHARMAC and that are likely to be relevant to the funding of a new pharmaceutical.

This manual mostly contains information on prices and unit costs. To estimate an average cost for input into an economic analysis, this data needs to be combined with data on resource use, such as the number of GP visits or the length of stay in hospital. Where feasible, resource use estimates should be based on New Zealand information from clinical guidelines, expert clinical opinion, clinical trials, and/or the Ministry of Health. If New Zealand data is not available, international sources may be used, but should be validated for the New Zealand setting.

The methods PHARMAC uses for economic analyses are published in the Prescription for Pharmacoeconomic Analysis (PFPA), available at www.pharmac.govt.nz/pfpa. The PFPA includes detailed recommendations on how to identify and include costs in health economic analyses. This Cost Resource Manual supplements the PFPA.

As recommended in the PFPA, all costs used in assessments exclude Goods and Services Tax (GST).

Method for collecting cost information

PHARMAC staff have searched for the most relevant and accurate prices and cost estimates, including contacting health organisations directly for data. The source of the costs and the date we received them are recorded in PHARMAC's cost database. When more than one cost estimate is available, for example, when costs differ between regions, an average cost estimate is often used. A number of the estimates are proxy as accurate cost information is unavailable.

Information and estimates are constantly changing; therefore, the costs listed in this document are subject to change at any time. We aim to update these costs as new information becomes available.

If you need other cost data to complete an assessment, please contact:

- the Ministry of Health (email: data-enquiries@moh.govt.nz)
- District Health Boards (DHBs)
- PHARMAC staff (healtheconomics@pharmac.govt.nz or the Manager, Health Economics).

Contents

1 Cost of pharmaceutical treatment

Total cost to the health sector

The total cost to the health sector of a pharmaceutical treatment for use in the community includes the:

- cost of the pharmaceutical
- pharmacy handling and service fees, pharmacy margin and pack fees (community pharmacy dispensing)
- cost of administering the pharmaceutical (if relevant)
- cost of the GP visit for the prescription (if relevant).

Treatments used in hospital settings may also have specific administration costs, such as for infusions.

Total cost to patients

The total cost to patients of a pharmaceutical treatment for use in the community includes the:

- patient prescription co-payment of $5 (excluding children)
- patient pharmaceutical part-charge (for pharmaceuticals not fully funded)
- cost of the GP visit to the patient for the prescription (if relevant).

In a hospital setting, the costs to patient may include costs of travel to reach a hospital or outpatient clinic.

1.1 Pharmaceutical price, dose, wastage

General pricing issues

When calculating pharmaceutical costs for a course of treatment, consider the following:

- What is the GST-exclusive subsidy?
- Are there any current or proposed confidential rebates?
- What pharmaceuticals are currently used and likely to be co-administered?
- What is the length of the pharmaceutical patent(s) and likely timing of generic entry?
- Are there any pharmaceutical patient part-charges?
- What doses are likely to be used in New Zealand (for proposed pharmaceutical and current treatment)?
- Is there likely to be any pharmaceutical wastage?

Price of proposed pharmaceutical(s)

The pharmaceutical price should be based on the GST-exclusive subsidy of the pharmaceutical as listed in the New Zealand Pharmaceutical Schedule (www.pharmac.govt.nz/pharmaceutical-schedule).

The rebated price of the pharmaceutical should be used if a rebate is proposed or, in the case of currently listed pharmaceuticals, if the rebate value is known. Cost calculations should also consider the length of the pharmaceutical patent; timing of generic entry; and expected price reduction from a generic pharmaceutical. For further details on estimating future prices, please refer to the PFPA.

Co-administered and comparator treatments

Prices for co-administered and comparator pharmaceutical should be taken from the current version of the Pharmaceutical Schedule (www.pharmac.govt.nz/pharmaceutical-schedule).

If patient manufacturer's surcharges apply, these should be included in the pharmaceutical cost calculations.

Over-the-counter pharmaceuticals should not generally be included in economic analyses for PHARMAC. Please refer to the PFPA for further details on which costs should be included or excluded from an assessment.

Pharmaceutical dose

The dose of the pharmaceutical should be the dose used in the key clinical trials, providing this is likely to be used in New Zealand clinical practice. Any dose adjustments over time should also be considered in cost calculations. For further details, refer to the PFPA.

The dose of the pharmaceutical may depend on the weight or body mass index (BMI) of the patient. Data on the average bodyweight of the New Zealand population (by age and gender) is available from the New Zealand Health Surveys

(www.health.govt.nz/publication/annual-update-key-results-2016-17-new-zealand-health-survey).

The average bodyweight of adults in New Zealand is 81 kg (87 kg for men and 75.3 kg for women).

If the bodyweight of the patient population to be treated differs significantly from the average population, further research should be undertaken to determine the bodyweight of the population to be treated. For example, patients with severe conditions may have a lower bodyweight compared to the average population of the same age and gender.

Pharmaceutical wastage

Pharmaceutical cost calculations should consider any drug wastage that may occur due to inappropriate vial size, or non-compliance, or if infusions cannot be stored once prepared. For example, if a vial cannot be stored once prepared, the full cost of the vial should be included in the analysis.

1.2 Pharmacy dispensing and distribution

Pharmacy costs to DHBs include (but are not limited to):

- pharmacy handling and service fee for pharmaceuticals dispensed at a community pharmacy
- pharmacy margin and pack fee
- brand switch fee.

For information on fees and payments of the Integrated Community Pharmacy Services Agreement, please refer to the following quick reference guide:

https://tas.health.nz/assets/Uploads/ICPSA-Fees-and-Payments-from-1-October-2018-Fact-Sheet.pdf

Pharmacy handling and service fees

Pharmacy handling and service fees should be included where the pharmaceutical is dispensed at a community pharmacy. These fees are paid by the DHB to the pharmacy for the provision of pharmacy services to customers. Along with core

pharmacy services, specific fees are paid for services such as the dispensing of class B controlled drugs, age-related residential care services, extemporaneously compounded preparation (ECP) services, bulk supply orders, and repeat prescriptions.

The calculation of pharmacy fees should consider the frequency of dispensing and any requirement for repeat prescriptions. The Pharmaceutical Schedule specifies a default period of supply for each pharmaceutical, generally 90 days. Full details are published in Part 4 "Community Pharmaceutical Dispensing Quantities for Subsidy" of the General Rules published at www.pharmac.govt.nz/pharmaceutical-schedule.

Details of the pharmacy handling and service fees are available at https://tas.health.nz/community-pharmacy/. The handling fee is a set fee that is applicable to the relevant transaction and is paid each time a pharmaceutical is dispensed against a prescription. The service fee is paid for each pharmaceutical on a prescription, and is calculated using a multiplier that is applied to the base handling fee. The relevant multiplier depends on the particular service.

Note that there are no pharmacy fees or mark-up on pharmaceutical cancer treatments (PCTs) or hospital pharmaceuticals provided by the hospital pharmacy.

Pharmacy margin and pack fee

The pharmacy margin is a contribution from DHBs to pharmacies towards pharmaceutical procurement and stockholding costs, calculated as a percentage of the Schedule subsidy.

The dispensing of unregistered subsidised pharmaceuticals (section 26 and section 29) by a community pharmacy is associated with a higher pharmacy margin, an administration fee, and a counselling fee.

The margin paid for Special Foods is a flat 4% of subsidy value. It does not change with the subsidy of the pack.

In addition to the pharmacy margin, a volume-based pack fee is also paid to pharmacies towards procurement and stockholding costs. This is calculated against the pack size listed in the Pharmaceutical Schedule. The fee is reviewed quarterly.

The current pharmacy margin and pack fees are published at

https://tas.health.nz/community-pharmacy/payments-and-procedures/

Extemporaneously compounded products – service fee and wastage

Extemporaneously compounded products (ECP) are pharmaceuticals that are compounded from two or more subsidised pharmaceuticals, for the purposes of reconstitution into a single vial/container or dilution to the correct strength or dosage. The products are compounded up to an amount tailored to each patient's individual treatment need. Compounding may be done by pharmacies, or for PCTs by third-party manufacturers.

Compounding pharmacies may claim the ECP service fee specified in the Community Pharmacy Services Agreement https://tas.health.nz/community-pharmacy/payments-and-procedures/.

A wastage component should be included in the calculations for PCTs compounded by third-party manufacturers. Typical wastage is 5-10%.

Brand switch

Pharmacies may receive an additional payment for advice given to patients on PHARMAC-led brand changes of $5.51 on the first changed dispensing for existing

patients. Note that this is not paid on all brand changes. DHBs set the criteria for when this fee may be applied.

1.3 Pharmaceutical administration costs

The cost of administering a pharmaceutical, such as an intravenous infusion (IV), should be included in the analysis. Settings in which this may occur are:

- hospital inpatient
- hospital outpatient
- home, GP surgery, hospice, or residential care.

Administration of a pharmaceutical in hospital

For inpatient events, the cost of an infusion is included in the WIES casemix funding and therefore should not be included separately.

Administration of a pharmaceutical in hospital outpatient setting

In cases where a pharmaceutical is administered in a hospital outpatient setting, it is recommended that a 'bottom-up' approach be used for calculating administration costs to capture the time component associated with an infusion and to avoid double-counting pharmaceutical costs. The relevant purchase unit (PU) price should be checked to determine if the bottom-up cost estimate is reasonable.

Outpatient pharmaceutical administration costs may include:

- outpatient clinic bed cost
- nursing time
- physician time.

Other outpatient infusion costs that may also be significant include:

- diagnostic tests required prior to infusion
- pre-medication
- materials required to deliver the infusion
- pharmacist time to prepare the infusion.

The time required for an infusion should be based on the administration protocol specified in the Medsafe datasheet, and should include:

- set-up of the infusion (allow approximately 15 minutes)
- administration of treatment (bed and nurse time)
- post-infusion monitoring.

The estimated clinic bed and nurse cost should be based on the total time required for the infusion.

The key costs and prices are in Table 2.

Table 2: Cost of outpatient infusions

Service	Cost ($)	Per	Source	Date of estimate	Notes
Bed costs					
Outpatient clinic bed	$65	hour	DHBs	2018	Allow time for monitoring following the infusion.
Human resource costs					
Nurse	$55	hour	NZ Nurses Organisation MECA	2018	Estimate based on salary and number of working hours per year, and includes overheads.
Physician	$35	infusion	Association of Salaried Medical Specialists DHB MECA	2018	Estimate based on 10-15 minutes of physician time.
Hospital pharmacist	$55	hour	PSA MECA	2018	Only include in cases where the preparation of infusion has a significant impact on pharmacist time. Estimate based on salary and number of working hours per year and includes overheads.

Administration of a pharmaceutical in a hospice, residential care, home, or GP surgery

The cost of administration of a pharmaceutical in a hospice or residential care facility should be included in the daily cost of care and therefore should not be estimated separately. (Note, however, that pharmacies receive a higher service fee for the provision of pharmacy services to residential care.)

The cost of home visits by a district nurse for administration should be included in the analysis in cases where more frequent visits are required for the administration of treatment. An approximate cost of $100 can be included in the analysis.

The GST-exclusive cost of an infusion at a GP clinic is approximately $170 (this includes the patient co-payment and government contribution).

1.4 Pharmacy costs to patients

Pharmacy costs to patients include:

- pharmaceutical co-payments for pharmaceuticals used to treat people aged 13 years and over
- manufacturer surcharges and pharmacy mark-up for pharmaceuticals not fully subsidised.

Patient co-payments

Most patients eligible for publicly funded pharmaceuticals are charged a pharmaceutical co-payment. This is currently $5 per new prescription item from most providers. There are no prescription co-payment charges for subsidised pharmaceuticals for children under 13 years of age. It is recommended that a pharmaceutical co-payment be included in cost-utility analyses for pharmaceuticals used to treat people aged 13 years and over. Further details on pharmaceutical co-payments are available on the Ministry of Health website

www.health.govt.nz/our-work/primary-health-care/primary-health-care-subsidies-and-services/pharmaceutical-co-payments.

Patient manufacturer's surcharge and pharmacy mark-up

Some pharmaceuticals listed on the Pharmaceutical Schedule are not fully subsidised and are therefore associated with a patient manufacturer's surcharge as the manufacturer's price is higher than the subsidy. The cost to the patient is the difference between the subsidy and the manufacturer's price, plus any additional mark-up a pharmacy may charge. The pharmacy mark-up on the surcharge varies between pharmacies, from between 50% to 200%. For cost calculations in economic analyses to PHARMAC, it is recommended that a pharmacy mark-up multiplier of 2 be applied to the difference between the subsidy and the manufacturer's price. A patient co-payment needs to be added to this calculation, as shown in the formula below:

patient cost = ((price-subsidy) *2) + patient co-

2 Primary health care

Primary health care costs include the cost of general practitioner (GP) and practice nurse visits.

Primary care services in New Zealand are funded by a combination of public funding from capitation-based payments and patient co-payments. Cost calculations should therefore be based on the average cost to the patient plus any government subsidy (if applicable).

Under the capitation payment system, primary health organisations (PHOs) and their general practices are paid according to the number of people enrolled, rather than the number of visits made by patients. Age, sex, ethnicity, and deprivation level of the enrolled patients are considered in calculating capitation levels. Capitation rates are revised each year. An approximate cost of a GP visit can be estimated based on the number of visits per enrolled patient within each age band.

The patient co-payment for a GP visit varies significantly between practices. An approximate price was used in cost calculations. GP and practice nurse visits are free for children under 13 years of age; therefore, the full cost is to the DHB.

Table 3: Primary health care costs

Service	Cost ($)	Per	Source	Date of estimate	Notes
General practitioner (GP) costs					
GP practice visit	$80	consult	Various PHOs	2018	Estimated average cost. Includes both patient co-payment and government contribution. GST-exclusive.
GP home visit	$170	consult	Various GP practices across NZ	2018	Estimate, includes patient co-payment and government contribution.
Nurse costs					
Practice nurse visit	$40	consult	Various PHO websites	2017	Based on a 10-15 minute consultation at a doctor's surgery. Includes both patient co-payment and government contribution.
Other primary care costs					
Repeat prescription fee	$15	Prescrip-tion	Various GP practices	2017	Average cost (GST exclusive).
Immunisation subsidy	$20.51	Immuni-sation	Ministry of Health	2018	Subsidy for administration of a vaccine to an eligible patient.

3 Investigative and diagnostic tests

3.1 Diagnostic imaging

Diagnostic imaging includes magnetic resonance imaging (MRI) scans, computerised tomography (CT) scans, x-rays and several other scans.

The following websites provide price information on radiology services:

- www.pacificradiology.com/#/referrers/referrer-pricing-guides
- https://broadwayradiology.co.nz/our-services/pricing
- http://eastmedradiology.co.nz/prices/
- www.riverradiology.co.nz/diagnostic-solutions/price-list/
- www.aucklandxray.co.nz/Home+Links/Price+List.html

It is recommended that the cost of diagnostic imaging be averaged across radiology services available in several regions, including Auckland. The cost should exclude GST.

Note that investigational procedures performed in hospital (ie where a patient is admitted to a hospital ward) are included in Diagnosis Related Group (DRG) prices and should not be costed separately.

3.2 Pathology tests

For details on laboratory test prices, please refer to the websites listed below:

- www.labnet.health.nz/testmanager/
- www.labplus.co.nz/about-us/labplus-price-list/
- www.labtests.co.nz/
- http://pathlab.co.nz/
- http://wellingtonscl.co.nz/charges-lab-tests
- www.wellingtonscl.co.nz/commercial-testing

We recommend that an average cost per laboratory test should be used in the CUA, based on the cost of the test in several regions (including Auckland). The cost should exclude GST.

4 Hospital costs

4.1 Hospital inpatient costs

Hospital inpatient costs should be sourced from the Ministry of Health inpatient data set. DRG definitions, prices and cost-weights are published on the Ministry's website (www.health.govt.nz/nz-health-statistics/data-references/weighted-inlier-equivalent-separations).

DRGs are a patient classification scheme that provides a clinically meaningful way of relating the number and types of patients treated in a hospital to the resources required by the hospital. DRG costs capture, to a certain extent, resources used by a particular group of patients and severity of conditions. DRGs apply only to admitted inpatient care (including certain same-day admissions), and therefore do not apply to emergency or short-stay events where the patient is not admitted to hospital.

All DRGs include inpatient pharmaceutical costs, except for oncology diagnoses and procedures.

Average DRG costs are calculated from a unit price that varies from year to year; the average length of stay (LOS); and the inlier cost-weight. In cases where more than one DRG code needs to be used, the cost per admission should be weighted by the number of discharges under each DRG code. The Ministry of Health is also able to supply data on the volume of discharges associated with each DRG for the financial year.

The 2018/19 cost-weight unit price is $5,068.12.

For further advice on calculating DRG costs, please contact the Ministry of Health at data-enquiries@moh.govt.nz.

Several additional hospital cost estimates are presented in the table below for cases where a hospital stay or surgery needs to be costed separately in an analysis.

Table 4: Additional hospital inpatient costs

Service	Cost ($)	Per	Source	Date estimated	Notes
Hospital costs					
Hospital medical ward	$1,200	day	Various hospitals	2017	Does not include cost of procedures.
Intensive care unit (ICU)	$5,500	day	Various	2017	
Human resources					
Specialist hourly rate	$150	hour	Association of Salaried Medical Specialists DHB MECA	2018	Estimate based on salary and number of working hours per year, and includes overheads (overheads estimated to be 50% of salary cost). Salary estimated based on MECA agreement.
Hospital nurse	$55	hour	NZ Nurses Organisation	2018	Estimate based on salary and number of working hours per

Service	Cost ($)	Per	Source	Date estimated	Notes
			MECA		year, and includes overheads (overheads estimated to be 50% of salary cost). Salary estimated based on MECA agreement.

4.2 Hospital outpatient costs

Hospital outpatient costs include:

- outpatient clinic visits, specialist consultations and minor operations
- emergency department visits
- dental care (in most cases the full cost is to the patient from age 18 years)
- blood transfusions performed as an outpatient or elective day case
- travel and accommodation reimbursed through the Ministry of Health National Travel Assistance Scheme
- outpatient education and case management sessions.

Outpatient costs can be estimated using outpatient purchase units. PU costs include all the activities associated with the outpatient event (eg nurse and physician time, administration, overheads and capital). Further information is available from the Nationwide Service Framework Library website https://nsfl.health.govt.nz/purchase-units.

Several outpatient costs are listed in Table 5.

Table 5: Additional hospital outpatient costs

Service		Cost ($)	Per	Source	Date estimated	Notes
Physician costs						
Physician visit (initial)		$350	consult	Various sources	2018	Includes overheads. Costs grouped by all specialties. Costs may differ by specialty.
Physician visit (subsequent)		$250	consult	Various sources	2018	As above.
Other costs						
Emergency department		$370	visit	PU cost and DHBs	2018	Cost varies depending on size of hospital, facilities and specialist availability.

5 Community health services costs

Community health services costs include:

- palliative care
- residential care (rest home, dementia care, and hospital care for the health of older people)
- in-home nursing, personal care and home help
- prenatal and postnatal care
- disability support services funded by the Ministry of Health
- ambulance services.

Some of the costs associated with health care in the community are outlined in table 6 below. Some costs can be estimated using Purchase Units.

Table 6: Community Care Costs

Service	Cost ($)	Per	Source	Date estimated	Notes
Residential and hospice care					
Rest home	$130	day	Various rest home providers	2018	National average costs.
Dementia care	$170	day	Various	2018	
Hospital care for health of older people	$200	day	Various	2018	
Hospice care	$690	day	Average across various hospice providers	2009 inflation-adjusted to 2018 prices.	Includes overheads. Varies by indication.
Ambulance					
Ambulance (emergency)	$680	event	St John ambulance	2017	GST-exclusive charge for non-eligible visitors. The patient part-charge for non-accident-related emergency call-outs is $83 (GST-exclusive).
Ambulance (non-emergency)	$175	event	St John ambulance	2017	Charge for non-emergency ambulance transport not covered by government, for distances less than 35 km. GST-exclusive price.

5.1 Palliative care

Patients may receive palliative care in hospital, a hospice, residential care facility or at home. In cases where patients receive palliative care in hospital, palliative care costs can be calculated from DRG prices. In cases where patients receive palliative care in the community, these costs can be calculated as the cost of home visits, residential care, and/or hospice care[1]. In most cases it is sufficient to use a proxy cost, with a range of costs included in the sensitivity analysis due to uncertainty and variation in costs. PHARMAC has estimated the cost of palliative care in the last week of life to be approximately $2,850, and the cost of the prior three weeks is estimated to be $1,730 per week (cost of four weeks' palliative care of approximately $8,050). Note that these are proxy costs and need to be varied in the sensitivity analysis.

Note that the cost of palliative care should be restricted to the palliative costs associated with the primary condition being treated.

6 Summary of costs

6.1 Costs to the pharmaceutical budget

Costs to the pharmaceutical budget of a pharmaceutical treatment for use in the community includes the cost of the pharmaceutical (including any proposed or current rebates).

6.2 Costs to the health sector

Costs to the health sector of a pharmaceutical treatment for use in the community may include:

- pharmacy handling and service fees, pharmacy margin, and pack fees (community pharmacy dispensing)
- the cost of administering the pharmaceutical
- a GP visit
- diagnostic and investigative tests
- pathology tests
- hospital care (inpatient and outpatient)
- travel and accommodation subsidy for hospital visits
- community health services (eg hospice care, residential care, in-home care, disability support services, ambulance).

6.3 Costs to patients, family, whānau and society

Costs to patients, family, whānau and/or society of a pharmaceutical treatment for use in the community may include:

- a patient prescription co-payment of $5 (excluding children)
- a patient manufacturer's surcharge (for pharmaceuticals not fully funded)
- the cost of the GP visit to the patient (part-charge for patients over 12 years of age)
- travel and accommodation for hospital visits

[1] The cost of hospice care varies widely by indication, level and duration of service support. *The Price of Cancer* (2011), a Ministry of Health study, gives estimates of hospice and other costs by cancer type (www.health.govt.nz/system/files/documents/publications/the-price-of-cancer-0811.pdf).

- residential care (where costs are not fully covered by the Residential Care Subsidy)
- an ambulance part-charge for non-accident-related emergency call-outs
- dental care.