Commonly used cost estimates:

Table 3: Standard unit cost estimates and sources

Resource	Estimate	Source
Average cost per day in medical ward (Alberta all sites)	$934	AHS Finance Fiscal 2018/19 NOTE: These are the average INCREMENTAL cost per day averaged over the entire Length of Stay (includes nursing unit + drug + allied health + DI + clinical lab + other clinical + incremental direct costs. Note: this cost excludes organizational support costs that do not fluctuate with changes in activity).
Average cost per day in general surgery ward (Alberta all sites)	$1,096	
Average cost per day in Critical Care (Alberta all sites)	$4559	
Average cost per ED visit (Alberta all sites)	$361	
Average cost per day by nursing unit, Calgary Zone	Variable	
Cost per physician encounter	Base rate $40.14, variable by specialty	Schedule of Medical Benefits March 2021 https://www.alberta.ca/fees-health-professionals.aspx (03.04A, comprehensive visit)
Cost of a drug	Variable	Alberta Blue Cross Interactive Drug Benefit List https://www.ab.bluecross.ca/dbl/publications.php Prices (public and private forumlaries): https://www.ab.bluecross.ca/providers/pharmacy-price-files.php
Dispensing fee	$12.15 per prescription	Alberta Health https://www.alberta.ca/pharmacy-services-and-fees.aspx
Laboratory test	Variable	AHS December 2016 https://www.albertahealthservices.ca/assets/wf/lab/wf-lab-bulletin-revised-laboratory-tests-and-associated-costs.pdf
Ambulance	Patient borne costs: $250 if a patient is treated at the scene, but not transported to a hospital, or $385 if a patient is transported to a hospital Operational cost per event: $760.48	Alberta Health https://www.alberta.ca/ambulance-and-emergency-health-services.aspx AHS Analytics

		Fiscal 2013/14. This estimate does not differentiate between transported and non-transported.
Time of patient/caregiver	Calculate based on $113,380 median family income in Alberta	2019 Statistics Canada http://www.statcan.gc.ca/tables-tableaux/sum-som/l01/cst01/famil108a-eng.htm
Travel per km patient/caregiver	47 cents per kilometer	2020 Canada Revenue Agency https://www.canada.ca/en/revenue-agency/services/tax/individuals/topics/about-your-tax-return/tax-return/completing-a-tax-return/deductions-credits-expenses/line-25500-northern-residents-deductions/meal-vehicle-rates-used-calculate-travel-expenses.html
Parking patient/caregiver	$14.25 per day	https://www.albertahealthservices.ca/fmc/Page17556.aspx
Childcare patient/caregiver	$950-$1,200/month	Alberta Government https://www.albertacanada.com/LivingAB_health_w.pdf

Useful data sources:

Annual Reports: this includes data over time on key performance indicators for Alberta Health and Alberta Health Services such as satisfaction, immunization rates, patient safety, life expectancy, ED length of stay.

Interactive Health Data Application: this includes demographic, mortality, chronic disease, infectious disease and children's health data for the province. http://www.ahw.gov.ab.ca/IHDA_Retrieval/

AHS Analytics: this group can provide a variety of cost and clinical data estimates. https://www.albertahealthservices.ca/findhealth/service.aspx?Id=1661&facilityId=1005258

AHS Finance: this group can provide detailed cost estimates. The strongest data are in-hospital costs for the 16 largest hospitals in the province.

Health Research Data Access: Administrative health data for research, planning, and projects can be requested, in addition to available online health data. https://www.alberta.ca/health-research.aspx

CIHI: this includes costing and utilization data by province and nationally. Their public data reports include hospitalizations, procedures, physician information, drug utilization, outpatient utilization and long-term care. https://www.cihi.ca/en/access-data-and-reports

Patient cost estimator: https://www.cihi.ca/en/patient-cost-estimator

Alberta Health Services

Published By:
Activity & Costing (Finance)

Cost Per Acute Care Bed (By Bed Type & Hospital Peer Group)

Calgary & Edmonton Zones

Methodology Documentation

Purpose/Customers/Outputs

Average cost of an acute care bed for a one year period i.e. Cost Per Bed, or a one day period i.e. Daily Cost Per Bed. These indicators compare acute care facilities, within peer groups and across bed types so that leaders and planners can see the relative costs of types of beds in the Edmonton and Calgary zones. The report is available by AHS zone or peer group.

Cost Per Bed provides a standard average cost that can be used in high level budgeting for the opening of new beds in existing facilities, and to validate detailed budget estimates for reasonableness.

The Daily Cost Per Bed can be used in service planning and economic evaluations that require the cost per day for an acute care inpatient in a specific program, such as Child Health PICU, Geriatrics, Neuroscience etc.

Incremental Cost Per Bed includes the direct costs and incremental indirect costs i.e. variable indirect costs that would be impacted by increases or decreases in patient volume.

Full Cost Per Bed includes the direct costs and all Organizational Support costs.

Data Sources/Inputs

Bed Days and Patient Days are queried from Alberta Patient Activity Workload Statistics (APAWS). Cost data is produced by the AHS Patient Case Costing systems from Finance.

Process

Acute care inpatient nursing unit functional centres are mapped to Bed Types, following the Canadian Institute of Health Information (CIHI) Management Information Systems Standards (MIS Standards). The annual number of Beds Staffed and In Operation for each inpatient nursing unit functional centre is tracked in APAWS and is adjusted for temporary bed closures during the year.

Calgary Zone : All costs are based on Fiscal Year discharged patients. As such, costs from prior year for patients admitted before the beginning of the year will be included, and current year costs for patients not discharged(still-in patients) will not be included in this report.

Edmonton Zone : Patient Case Costing data for the fiscal period is processed and grouped by Bed Type. For each patient in an acute care bed, costs associated with the patient are grouped into the patient's Bed Type, for each day of the patient's stay. Costs associated include drug costs, Allied Health, Diagnostic Imaging, Clinical Lab, Other Clinical Services, as well as incremental indirect costs. If a patient is in more than one Bed Type in a day, all of the patient's costs group to the Bed Type with the most costs.

Excluded Costs

- Surgical Suites, Procedural and Recovery Room costs are not included as these services would be funded separately from acute care beds. This includes OR Operating Room, PARR, L&D, Cardiac Catheterization Labs, EP Lab, Endoscopy, Pacemaker Suites and Clinics, ECMO.
- Costs for EDIP Emergency Department inpatients waiting for a bed are not included.
- Costs from functional centres that don't have proper unit costs, due to incomplete workload, misalignment between the activity and workload, inability to associate high cost supplies to specific patients, etc. These costs are not material to the cost of a bed.
- Accountable grants, research and education costs are not included.
- Surgery - Ophthalmology: costs not available for 2018-19 due to a workload issue which materially understated the costs for this bed type.

Site List (Fiscal Years 2016-17 and 2017-18)

Tertiary Referral -- Alberta Childrens Hosp
Tertiary Referral -- Foothills Medical Centre Hosp
Tertiary Referral -- Royal Alexandra Hosp
Tertiary Referral -- University of Alberta Hosp
Regional Referral -- Grey Nuns Hospital
Regional Referral -- Misericordia Hospital
Regional Referral -- Peter Lougheed Hosp
Regional Referral -- Rockyview General Hosp
Regional Referral -- South Health Campus
Regional Referral -- Sturgeon Community Hosp
Specialty Rehab -- Glenrose Rehabilitiation Hosp
Specialty Psychiatric -- Southern AB Forensic Psychiatry Centre
Community - Small -- Devon General Hosp
Community - Small -- Redwater Hosp
Community - Medium -- Leduc Community Hosp
Community - Medium -- Stony Plain WestView Hosp
Community - Large -- Fort Saskatchewan HC
Community - Large -- Westlock HC

Site List (Fiscal Years 2018-19)

Note: Edmonton Zone costing was limited to the Tertiary and Regional Referral sites only.

Tertiary Referral -- Alberta Childrens Hosp
Tertiary Referral -- Foothills Medical Centre Hosp
Tertiary Referral -- Royal Alexandra Hosp
Tertiary Referral -- University of Alberta Hosp
Regional Referral -- Grey Nuns Hospital
Regional Referral -- Misericordia Hospital
Regional Referral -- Peter Lougheed Hosp
Regional Referral -- Rockyview General Hosp
Regional Referral -- South Health Campus
Specialty Rehab -- Glenrose Rehabilitiation Hosp
Specialty Psychiatric -- Southern AB Forensic Psychiatry Centre

Source: [Cost Per Acute Care Bed (By Bed Type & Hospital Peer Group): CostPerBed - AHS Tableau Server (albertahealthservices.ca)]

Alberta Health Services

Published By:
Activity & Costing (Finance)

Cost Per Acute Care Bed (By Bed Type & Hospital Peer Group)

Calgary & Edmonton Zones

Cost Definitions Documentation

Contents / Indicators

Bed Type: Inpatient nursing unit functional centres are assigned to bed types. This facilitates standardized comparisons by categorizing nursing units that have similar levels of care and patient characteristics. A list of bed types that have standard costs is provided in the section Bed Types.

Peer Group: Assigning hospitals to peer groups facilitates standardized comparisons by categorizing facilities that have similar structural and patient characteristics. Site peer group designations have been defined by DIMR.

Zone: Description of the AHS geographic zone where the acute care facility is located.

Site: Name of the AHS acute care facility.

Bed Count: Bed count is calculated by dividing the total bed days by the number of calendar days in a given period. Bed days are the number of days a bed was available and staffed to provide services to inpatients at the required type and level of service. This method takes into account beds being added/removed during the period as well as temporary bed closures.

Patient Days: The total number of Elapsed Patient Days on the inpatient care units. Elapsed Days reflect the patient's actual time in the care unit e.g. if the patient is in the inpatient care unit for 12 hours, the Elapsed Day is .5. Note that the Elapsed Day indicator is not adjusted for patients on pass.

Average Direct Cost Categories

Nursing Unit: Average direct cost for inpatient nursing care units, including direct staffing, supply, equipment costs, and equipment depreciation. Includes average direct allocated cost such as patient care administration, nurse educators, nurse practionners, medical compensation funded by operations (surgical assistants), etc.

Drug: Average drug cost, including drug costs identified as consumed by specific patients and the remainder of wardstock drug costs.

Allied Health: Average direct cost for services provided by Allied Health disciplines, including direct staffing, supply, equipment costs, and equipment depreciation. Includes (71445 Clinical Nutrition, 71450 Physiotherapy, 71455 Occupational Therapy, 7146020 Speech Language Pathology, 7146040 Audiology , 71475 Social Work, 71475 Psychology, 71480 Spiritual Care, 71485 Recreation, 71490 Child Life, 71435 Respiratory Services, 71495 Multi-disciplinary). Includes average direct allocated cost such as patient care administration, educators, etc.

Diagnostic Imaging: Average direct cost for 71415 Diagnostic Imaging services , including direct staffing, medical interpretation fees, supply, equipment costs, and equipment depreciation. Includes average direct allocated cost such as patient care administration, educators, centralized equipment maintenance, etc.

Clinical Lab: Average direct cost for 71410 Clinical Lab services , including direct staffing, medical interpretation fees, supply, equipment costs, and equipment depreciation. Includes average direct allocated cost such as patient care administration, educators, pathologist compensation, etc.

Other Clinical: Average direct cost for other clinical services, including direct staffing, medical interpretation fees where available, supply, equipment costs and equipment depreciation. Other clinical services include but are not limited to the following: Cardiac Diagnostic services (e.g. ECGs, ECHOs, Cardiac Stress Testing); Neuro Diagnostic Services (e.g. EEGs); Day/Night Care (e.g. Hemodialysis); Ambulatory Care Clinics (e.g. Cardiac, Medicine, Orthopedic, Pediatric, etc.); Nursing Services (e.g. Rapid Response Teams, Nurse Practitioners, Ostomy & Wound Care). Includes average direct allocated cost such as patient care administration, educators, etc.

Average Indirect Cost Categories

Incremental Indirect: Average variable overhead cost that would be impacted by increases or decreases in beds. Includes costs for: 71135 material management; 71145 housekeeping; 71150 laundry & linen; 71175 biomedical engineering; 71180 registration; 71182 admission/discharge coordination; 71190 health information; 71195 patient food; 71440 pharmacy.

Organizational Support: The Non-Incremental Indirect Allocation Costs are portions of the Organizational Support Costs that are not likely to fluctuate directly with the change of activities, such as Site and Regional Administration (IT, Human Resources, Finance, Security, Utilities etc.).

Incremental Cost Per Bed/Day/Delivery

Cost Per Bed: Total Costs (Nursing Unit + Drug + Allied Health + Diagnostic Imaging + Clinical Lab + Other Clinical + Incremental Indirect) divided by the Bed Count. Note that for Labor & Delivery and LDRP Bed Types, a Cost Per Mother Delivered is instead provided as this is a more relevant indicator.

Daily Cost Per Bed: Total Costs (Nursing Unit + Drug + Allied Health + Diagnostic Imaging + Clinical Lab + Other Clinical + Incremental Indirect) divided by the number of Patient Days. Note that for Labor & Delivery and LDRP Bed Types, a Cost Per Mother Delivered is instead provided as this is a more relevant indicator.

Full Cost Per Bed/Day/Delivery

Cost Per Bed: Total Costs (Nursing Unit + Drug + Allied Health + Diagnostic Imaging + Clinical Lab + Other Clinical + Incremental Indirect + Organizational Support) divided by the Bed Count. Note that for Labor & Delivery and LDRP Bed Types, a Cost Per Mother Delivered is instead provided as this is a more relevant indicator.

Daily Cost Per Bed: Total Costs (Nursing Unit + Drug + Allied Health + Diagnostic Imaging + Clinical Lab + Other Clinical + Incremental Indirect + Organizational Support) divided by the number of Patient Days. Note that for Labor & Delivery and LDRP Bed Types, a Cost Per Mother Delivered is instead provided as this is a more relevant indicator.

Source: [Cost Per Acute Care Bed (By Bed Type & Hospital Peer Group): CostPerBed - AHS Tableau Server (albertahealthservices.ca)]

UNIVERSITY OF CALGARY

Alberta Costing Approach

Alberta Health Services

Published By:
Activity & Costing (Finance)

Emergency Department Cost Per Visit By Triage Level

Provincial (All Zones)

Methodology Documentation

Purpose/Customers/Outputs
Cost per visit measure the relative cost-efficiency of a care facility's ability to provide emergency department care. The result is the care facility's average cost of treating an emergency department patient. These indicators compare care facilities between peer groups so that leaders can see the relative costs of emergency department visits across the province. The acuity or intensity of service can differ between sites resulting in cost per differences; i.e. the reason for both cost per visit and cost per weighted visit.

Data Sources/Inputs
Visit and Triage Level data queried from Discharge Abstract Database (DAD).
Cost data is sourced from the AHS patient costing system, which aligns patient activity and workload data to the Financial General Ledger costs.
Resource Intensity Weightings are assigned by Canadian Institute for Health Information (CIHI).

Process
- Direct costs summed from the Financial General Ledger for Emergency Department functional centres.
- Direct costs are reduced EDIP (patients waiting to be admitted). EDIP is calculated using a formula from the Staffing Methods & Benchmarking Team (Activity & Costing).
- Allocated Cost includes such items as Pharmacy, Laundry & Linen, Housekeeping, Admitting, Central Sterilization Room (CSR), Material Management, Biomedical Engineering, Health Information, Interfacility Transport, Centralized Oxygen and Porters. These items are likely to vary in response to changes in activity.
- RIW use the CACS (Comprehensive Ambulatory Classification System) outpatient version of CMG (Case Mixed Grouper). The Ambulatory RIW has been adjusted to better represent Ambulatory costs separate and apart from IP Costs.

Peer Group: Assigning hospitals to peer groups facilitates standardized comparisons by categorizing facilities that have similar structural and patient characteristics. The report uses the peer groupings defined by the Clinical Operations Executive Committee (COEC). The report uses the term Community Large for Community (Specialty Services With Less Than 5,000 Inpatients), Community Medium for Community (Specialty Services With Greater Than 600 Inpatients) and Community Small for Community (Less Than 600 Inpatients) to conserve space.

Excluded Costs
- Direct costs may be excluded due to variations in distribution of expenses to functional centres.
- Non-operational Balancing Units (Restricted Funds) are excluded as they are not reporting activity or are temporary in nature (ie: study/research/renovation). Restricted Funds should not have an impact on resources serving patients.
- Direct cost exclude revenues, amortizations, Gain/Loss on Equipment Disposal, Interest on Equipment Loan, Bad Debt Expense, Building Amort and Interest on Long Term Debt.

Excluded Sites
Costs for Suburban / Rural sites have not been validated. Certain Suburban / Rural sites have been excluded due to obvious MIS misalignment or allocation issues. Rural site exclusion criteria:
- Direct ED Cost < $250,000: The primary reason for site having low Direct ED Cost is nursing salaries located in non-ED Functional Centres.
- Direct Cost Per Visit < $50: Additional parameter to filter sites where nursing assistance is likely being provided from non-ED Functional Centres. These are Sites with high ED visit volume, but where dedicated ED nursing staff does not appear sufficient to offset the volume.
- ED Visits < 1000: Sites with activity mapping issues or missing activity data.
- Allocated Cost Per Visit < $10: Incomplete amount in the allocation calculation.
- Total Visits < 7,500 AND direct cost > $750,000: Exclude sites with low volumes where costs are being inflated by minimum staffing requirements with insufficient volume and/or where ED staff may be assisting non-ED areas.
- Additional Site Exclusion: Site 0305 (Northeast). This is an urgent care site, and its ED is not comparable to the ED in acute care sites.

Triage Level
- Triage Level 1 = Resuscitation: Conditions that are threats to life or limb requiring immediate aggressive interventions.
- Triage Level 2 = Emergent: Conditions that are a potential threat to life, limb or function, requiring rapid medical intervention or delegated acts.
- Triage Level 3 = Urgent: Conditions that could potentially progress to a serious problem requiring emergency intervention.
- Triage Level 4 = Less Urgent: Conditions that are related to a patient's age, distress or potential for deterioration or complications that would benefit from intervention or reassurance within one to two hours.
- Triage Level 5 = Non-urgent: Conditions that may be acute but non-urgent as well as conditions that may be part of a chronic problem, with or without evidence of deterioration.
- Triage Level 9 = Not Documented: Occurs when triage level is not documented or patient leaves before triage.
- Clinical Visits = Scheduled Outpatient patients seen in the Emergency Department (ie: IV therapy patients scheduled after clinic hours).

Note
- The Stollery Children's Hosp is combined with the University of Alberta Hosp.
- 5% has been deducted from the costs in the Incremental Allocation, Pharmacy/Drug Allocation and DI/Lab/RT Alloc calculations to remove corporate administration.

Direct Cost: Total direct costs of the site queried from MR and summed by site. ED Costs are identified by MIS Primary codes beginning with 71310 and include 7131070* (Emergency Mental Health Service).ED costs are filtered to include only lines with an account type of Expense. ED costs are filtered to exclude any lines where the object type is Amortization. Non-operational Balancing Units (Restricted Funds) are excluded as they are not reporting activity or are temporary in nature (ie: study/research/renovation). Restricted Funds should not have an impact on resources serving patients.

Direct Cost EDIP Estimate: Emergency Department Inpatient (EDIP) estimate are costs removed to account for patients that are held in ED because no IP beds are available when the patient is to be transferred out of Emergency and patient requires continued ED resources. Model for estimating EDIP costs was developed by the Staffing Methods & Benchmarking Team (Activity & Costing). Model has a threshold of 125 EDIP days per quarter (or 500 EDIP days per year) before EDIP calculation begins. Staffing estimates are based on nurse to patient ratios: Critical Care 1 RN to 1 patient; Non-Critical Care - Pediatric ED 1 RN to 3 patients, Non-tertiary ED 80/20 RN/LPN mix with 1 nurse to 4 patients, Tertiary ED assigned 50% refined days at 1 RN to 3 patients and 50% refined days 80/20 RN/LPN mix at 1 nurse to 4 patients. Model estimates unit clerk resource and supply costs based on the EDIP refined day volumes.

Incremental Allocation: Incremental Allocation Cost includes such items as Laundry & Linen, Housekeeping, Admitting, CSR (Central Sterilization Room), Material Management, Biomedical Engineering, Health Information, Interfacility Transport, Centralized Oxygen and Porters in the Calgary Zone (*Located within the functional centre for the Edmonton Zone). These items are likely to vary in response to changes in activity.

Pharmacy / Drug Allocation: Pharmacy / Drug Incremental Allocation Cost includes such items as Centralized Pharmacy and Centralized Drugs. These items are likely to vary in response to changes in activity.

DI/Lab/RT Allocated Cost: Patient case costing for Emergency departments which include Diagnostic Imaging, Lab and Respiratory Therapy is not available outside the Edmonton zone. To model these costs for all Emergency Departments, the average proportion for Diagnostic Imaging, Clinical Lab and Respiratory Therapy of the Edmonton zone hospitals is applied, by Triage level. Triage 5 percentage is applied to Triage 9. For example, if the total direct Emergency cost is 1,000,000, DI cost is 300,000, Lab is 200,000 and RT is 250,000 for triage 1. The DI ratio is 30%, Lab ratio is 20% and the RT ratio is 25% against the total direct Emergency cost for triage 1.

Cost Per Visit: Sum of Direct Cost, Incremental Allocation, Pharmacy/Drug Allocation, DI/Lab/RT Allocation Less EDIP Estimate, Divided by Number of Visits.

Cost Per RIW: Sum of Direct Cost, Incremental Allocation, Pharmacy/Drug Allocation, DI/Lab/RT Allocation Less EDIP Estimate, Divided by RIW.

Source: https://tableau.albertahealthservices.ca/#/views/CostPerEmergencyDepartmentCasebyTriageLevelProvincial/EDCostPerVisit?:iid=2