BC Stroke Strategy

Regional Stroke Action Plan

Appendix B –

FRASER HEALTH AUTHORITY

HEART & STROKE FOUNDATION OF BC & YUKON
Finding answers. For life.
BRITISH COLUMBIA The Best Place on Earth | Ministry of Health
PROVINCIAL Health Services AUTHORITY
BRITISH COLUMBIA AMBULANCE SERVICE
PARTNERS IN RECOVERY
Stroke Recovery Association of British Columbia
fraserhealth Better health. Best in health care.
Interior Health
northern health
Vancouver CoastalHealth Promoting wellness. Ensuring care.
VANCOUVER ISLAND health authority

Acknowledgements & Contributions

At the request of both the Ministry of Health Services and the health authorities, the Heart and Stroke Foundation of BC & Yukon has lead the BC Stroke Strategy (BCSS) initiative over the last five years, working in partnership with agencies and organizations representing those involved in stroke prevention and treatment and advancing the planning and prototyping phases for a number of priority areas, some of which are incorporated in this provincial plan.

The BCSS would like to acknowledge all the organizations and individuals who contributed to this work. Key contributors involved in the development or review of the Stroke Action Plan include but are not limited to the following:

Organization	Representative	
Heart and Stroke Foundation of BC & Yukon	• Mark Collison – BCSS Lead	• Diego Marchese – Executive Advisor
BCSS Core Team	• Diane Layton – BCSS Project Manager • Dr. Allan Holmes – ACVS Medical Consultant • Laura Reeves – ACVS Project Manager	• Dr. Hans Krueger – Metrics and Data Modeling • Helen Truran – Telestroke Clinical Lead • Mary Stambulic – BCSS Administrative & TeleLearning Coordinator
Clinical Experts	• Dr. Philip Teal – VCH • Dr. Kennely Ho – FH • Dr. Andrew Penn – VIHA • Dr. Devin Harris – Providence • Dr. Dean Johnston – Providence	• Dr. Todd Collier – IH • Dr. Jacqueline Pettersen – NH • Dr. Graydon Meneilly – VCH • Dr. Jennifer Yao – VCH
Ministry of Health Services – Health Authority Division	• Brenda Canitz (CCM / KRA) • Liv Brekke (CCM / KRA) • Leigh Ann Sellers • Munjeet Bhalla	• Alex Scheiber
Ministry of Health Services – Medical Services Division	• Dr. Dean Kolodziejczyk	
Ministry of Health Services – Primary & Community Care Division	• Val Tregillus • Darcy Eyres	
BC Ambulance Service	• Dr. Karen Wanger	
Fraser Health	• Barbara Korabek – Exec Sponsor • Susan Brown – Exec Sponsor • Michelle deMoor – Stroke Lead until spring 2010	• Heather Mash – Current Stroke Lead • Kevin Harrison – Regional Stroke Coordinator
Vancouver Coastal Health	• Dr. Patrick O'Connor – Exec Sponsor • Dr. Jeff Coleman – Exec Sponsor • Donna Stanton – Exec Sponsor	• Lisa Hoefer – Stroke Lead until Spring 2010 • Dixie Butts – Current Stroke Lead
Vancouver Island Health	• Dr. Allan Meakes – Exec Sponsor • Marilyn Copes – Exec Sponsor • Dr. Wayne Shtybel – Regional Medical Lead	• Leighanne Mackenzie – Stroke Lead until summer 2010 • Robert Crisp – Current Stroke Lead
Interior Health	• Darlene Arsenault – Exec Sponsor	• Lori Seeley – Current Stroke Lead
Northern Health	• Dr. David Butcher – Exec Sponsor • Ruby Fraser – Exec Sponsor	• Rita Sweeney – Current Stroke Lead
Provincial Health Services (PHSA)	• David Babiuk – PHSA	• Janis McGladrey – PHSA

Key messages / products of various working groups of the BCSS have been incorporated into this Provincial Plan. These groups include the following:

- The ACVS Clinical Consensus / Expert Group
- The ACVS Advisory Group
- The joint MoHS / BCSS Measurement & Evaluation Working Group
- The Rehabilitation and Reintegration Expert Advisory Group
- The TIA Rapid Assessment Advisory Group
- The Telestroke Advisory Group

In addition to individuals actively serving on BCSS working groups, numerous clinicians and operations managers at site levels were involved in identifying gaps in care and in strategizing on possible approaches / strategies to address these gaps. The input from these multiple sources is reflected in this Provincial Plan and detailed in the Regional Site Work Plans included in the Appendices. We would like to thank all those persons and organizations that contributed to this collaborative planning work.

Requests regarding access to Regional Appendices or to other documents referenced in this Provincial Stroke Action Plan should be directed to:

Mary Stambulic – BCSS Administrative Coordinator,
Telephone 250-595-8074
Email: info@bcstrokestrategy.ca or marystambulic@shaw.ca

Or visit the BC Stroke Strategy Website @ www.bcstrokestrategy.ca

TABLE OF CONTENTS

FRASER HEALTH

Regional Snapshot – March 2010

FRASER HEALTH
SNAPSHOT OF STROKE SERVICES AS OF MARCH 2010

Organizational Commitment to Stroke	Current Structures to Support Stroke
Strong verbal commitment and recognition of the importance of advancing the work of the Stroke Strategy – but no plan at this time to commit operating dollars / resources. Integrated Stroke Strategy Document – December 2004 by Dr. Kennely Ho. A full-time stroke coordinator (Kevin Harrison). Identified Regional Director Lead for Neurology. Identified Regional Physician Lead for Neurology.	Regional Stroke Strategy Steering Committee with Working Groups in various stages of formation and evolution – including: • Awareness & Prevention (forming); • Acute and Emergency Services (active); • Rehab and Community Reintegration (forming); and • Monitoring and Evaluation (active). Survey of Stroke Services and Resource Inventory recently completed for all FHA sites. Development of order sets, tools, pathways to standardize stroke care. Regional Stroke Lead and Coordinator could both use administrative support and clinical nurse specialist support to make best use of their time and skill sets. In addition to regional structures / systems – Royal Columbian and Surrey Hospitals have formed their own working groups composed of Local Champions. Increasing emphasis on measurement and evaluation (e.g. Surrey undertook an informal cohorting of patients / beds and saved over 1100 bed days). Key measurement factor is establishing a service designation for “cohorted beds “ or “stroke unit” in order to track / report on activity – rather than rolling into the hospital-wide numbers.

Comprehensive Stroke Centres	Regional Stroke Centres	Primary Stroke Centres
Tertiary centre providing a full range of services including neurosurgical/radiological interventions and rehabilitation None	**Regional hospital providing CT, tPA, Telestroke links to Comprehensive Stroke Centre** Royal Columbian Hospital	**Provides CT, tPA and organized emergency care, links to Regional and Comprehensive Stroke Centres** Abbotsford Regional Hospital Burnaby Hospital Chilliwack General Langley Memorial Hospital Peace Arch Hospital Ridge Meadows Hospital Surrey Memorial Hospital

Current Emergency and Inpatient Focus		
Pre-hospital	**Emergency**	**Inpatient**
No "drip and ship" protocols in place to divert patients to appropriate sites. 3 TIA Clinics (SMH, RCH, ARH) – working on sustainability plans. Keen to finalize and confirm facility role designations and to get by-pass and repatriation protocols in place.	- working on standardized order sets for use across the region (i.e. stroke order sets, tPA order sets, non-tPA order sets). -working on a multi-site order set for FH. - sustainment of current Telestroke sites and developing guide for use at PAH and CGH. - need to confirm how many Telestroke-enabled sites are required for the region and then officially designate them in these roles.	- shortage of Neuro-trained CNS support to drive clinical tools and pathways. - reviewing current care pathways in existence at FH with view to standardizing across the region. - cohorting of beds at Royal Columbian and Surrey Memorial Hospitals. - SMH and RCH working on and testing "cohort" patient pathway.

Current Inpatient Rehabilitation		
Comprehensive Rehab Stroke Centres	**Regional Rehab Stroke Centres**	**Primary Rehab Stroke Centres**
Closest Comprehensive Rehab Stroke Centre is: **G.F. Strong Centre, Vancouver, Acquired Brain Injury Program (ABI)**	**Surrey Memorial Hospital and Royal Columbian Hospital:** - 10 cohorted stroke beds with additional rehab resources (not a true stroke unit). This unit is acute and not rehab. ***Surrey Memorial Hospital:** - High intensity Rehab Unit, not stroke specific (20 beds) ***Eagle Ridge Hospital:** - High intensity Rehab Unit, not stroke specific (19 beds) * Primary Stroke Centres providing regional rehab services	Sub-acute Rehab Units at some sites – mixed diagnosis units that do serve stroke patients **Peace Arch Hospital** - 12 beds **Abbotsford Regional Hospital** - 25 beds **Chilliwack General Hospital** - 20 beds **Burnaby Hospital** - 16 beds in development **Ridge Meadows Hospital** - 25 beds **Queens Park Continuing Care (New Westminster)** - 26 beds

Stroke Leads / Operations Leads	Medical Leads/Stroke Specialists
Susan Brown and Barbara Korabek – Executive Sponsors Heather Mash – Regional Stroke Lead Kevin Harrison – Regional Stroke Coordinator Darlene Emes – Program Director (Emergency) Karen Watson – Program Director (Critical Care) Kathy Doull – Director of Rehabilitation Services Jerry Stanger – Director, Home Health (ABI)	Dr. Drew Dawson, Medical Director, Rehabilitation Program Dr. Kennely Ho – Neurologist (RCH) Dr. George Medvedev – Neurologist (RCH) Dr. William Siu – Radiologist (RCH) Dr. Sheldon Glazer – ERP (RCH) Dr. John Diggle – Neurologist (SMH) Dr. Anthony Costantino – Neurologist (ARH) Dr. Peter Boulton – Neurologist (ARH) Dr. James Rudnik – IM, PAH

FRASER HEALTH

Role Designation / Functional Capacity

FRASER HEALTH
HOSPITAL ROLES AND FUNCTIONAL CAPACITY
AS OF SPRING 2010

Note that this grid does not necessarily reflect current capacity at some of the sites but represents the role the hospital could play once all the necessary supports and systems are in place.

FHA Hospitals / Facilities	Current Hospital / Facility Functional Capacity for Stroke Care						
	CT Scan	CT Tech	tPA Enabled	Neurology/ Internal Medicine	Stroke Unit / Cohorted	Require Telestroke Support	Catchment Stroke Center
Level 2: Regional Stroke Centre							
Royal Columbian	Y	Y	Y	Limited available N	Y	Not if 24/7 Neuro	Y
Level 3: Primary Stroke Centre							
Abbotsford Regional	Y	Y	Y	24/7 Neuro	N	Part time	Y
Burnaby Hospital	Y	Y	Y	24/7 Neuro	N	Not required	N
Chilliwack General	Y	Y	Y	24/7 IM	N	Full time	N
Langley Memorial	Y	Y	Y	24/7 IM	N	Full time	N
Peace Arch	Y	Y	Y	24/7 IM	N	Full time	N
Ridge Meadows	Y	Y	Y	24/7 IM	N	Full time	N
Surrey Memorial	Y	Y	N	24/7 IM - Ltd. Neuro	Y	Part time	Y
Level 4: Non tPA Enabled Site							
Eagle Ridge	Y	Y	N	24/7 IM	N	NA	N
Delta Hsopital	Y	N	N	24/7 IM	N	NA	N
Fraser Canyon	N	N	N	NA	N	NA	N
Mission Memorial	N	N	N	24/7 IM	N	NA	N

Stroke Management Criteria	Definitions / Scope
Telestroke	Require telehealth, clinicians & CT-associated network capabilities to support clinical processes across the stroke care continuum.
CT Scan / MRI	Timely neuroimaging.
Tech available	Trained techs on site.
Stroke Team	Stroke team in ED; protocols for acute stroke in ED; early and appropriate acute stroke care + tPA within 3 hours; non-tPA-enabled sites have written protocols to transfer patients in timely way to the appropriate destination.
Neurology / Internal Medicine	Neurology and IM support available to manage acute strokes.
Neurosurgical / Neurointerventional	Medical & Diagnostic Imaging Specialists on site, available by phone, or by Telestroke.
tPA enabled	Medical & diagnostic capabilities on site to enable / administer tPA.
Acute stroke pathway	Stroke pathway includes stroke order sets, patient flow processes, time-specific interventions.
Bypass Protocol/Rapid Transfer	EMS transport of suspected stroke patient to most appropriate site within 3.5 hour pre-hospital time window.
Stroke unit/ cohorted beds	Stroke Unit or geographically designated beds; evidence-based pathways / protocols to ensure organized interventions, targeting prevention of complications and ensuring early mobilization and rehabilitation.
Catchment stroke center	Facility serves a defined geographic region.
Rehab	Standardized (system) screening evaluation to determine impairments and most appropriate level of rehabilitation; comprehensive rehab plan to initiate early, coordinated multidisciplinary stroke rehab. Recovering movement, daily activities, communication; early discharge planning and smooth transitions.
Secondary stroke prevention clinic	Stroke prevention services in a variety of settings including hospital or community-based settings.
Stroke Care Monitoring and Evaluation	Routine collection of performance measures for stroke care.

FRASER HEALTH

Priority Themes

FRASER HEALTH
REGIONAL THEMES / PRIORITIES
PRIORITY AREAS OF FOCUS (ONE TO THREE YEARS)

Priority	Action Plans	Major Stakeholders

Implement Acute Stroke Cohort Units at: SMH, RCH, ARH	• Monitor & support progress at SMH & RCH
	• Support planning and startup at ARH
	  o Service delivery model
	  o Resources
	  o Standards of care
	  o Evaluation
	• Establish gold standard : Acute Stroke Units
	  o Business plan to address gap between Cohort Units and Stroke Units
	
	Timeline: 18 months
		• Stroke Coordinator/Neurology Director
		• Site teams
		• Regional Rehab program

Develop Regional Order Sets and Care Paths	• Formation of regional working group for order set development (2010)
	• Integration of stroke orders into CNE directed education activities
		• Stroke Coordinator/Neurology Director
		• Regional working group
		  o Core working group
		  o Site teams
		• ER and Acute CNE groups

Increase tPA Administration	• Monitor progress of Telestroke at CGH & PAH • Identify other potential Telestroke sites and broaden to include LMH and RMH • Support planning and implementation of tPA protocols at SMH, LMH, & RMH • Continue data collection for QI and planning • Maintain participation in BC Telestroke	• Stroke Coordinator/Neurology Director • Critical Care and ER Programs • Site teams
Expand Secondary Prevention	• Add post-stroke consultations and support by determining what people need • Utilize group education activities in clinics • Expand linkages to pre-existing chronic disease management programs and primary care initiatives (e.g. IHN's) • Become involved with stroke research activities	• Stroke Coordinator/Neurology Director • Primary Care • Health Promotion • TIA Clinic Working Group • FH Research Admin & Development • Stroke Advocacy Group

Develop Comprehensive Rehabilitation Service Delivery Plan	• Regional Neuro Rehab Review being undertaken by FH Rehab Program
	• Link with existing resources as partners
	• Continue participation in BC Stroke Strategy Rehab Provincial working group activity:
	  o Community-based Rehabilitation & Reintegration demonstration project
	  o Rehab & Reintegration Service Delivery Framework
		• Stroke Coordinator/Neurology Director
		• FH Rehab Program

FRASER HEALTH

Site Work Plans

FRASER HEALTH
SITE WORK PLANS

Site	ACVS Requirement	Current State	Gaps in Provision	Action Plan	Priority (1-3)
LEVEL 2 – REGIONAL STROKE CENTRE					
Royal Columbian Hospital Site Lead for Stroke: Rizalina Bejar, HSM	Bypass Protocol	HLOC Protocol	No Protocols in place to divert patients from other sites in FH. No 'drip & ship' protocols.	Determine capacity needs for RCH to support diversion protocols. Should be supporting site for ERH.	2
	CT Scan	24/7 In House. 15 Minute Response Time	None identified		
	tPA & Organized Emergency Care	tPA Protocol for site, not yet regional	Regional Protocol to be Developed.	Bring forward the recently revised order set for adoption at the regional level.	1
	Provides Telestroke Support	Not a Telestroke consulting site. VGH providing Telestroke support for CGH and PAH.	Provision of Telestroke consulting support.	Development of Neurology Consult Network.	3
	Local Neurology or Internal Medicine Support	24/7 IM Support Gaps in neurology coverage	Achievement of 24/7 neurology coverage.	Recruit for 24/7 Neurology coverage.	1
	Stroke Unit On Site / Access to Stroke Unit through Diversion Protocols	Stroke Cohort in development.	Nursing and Allied Health Resources for Acute Stroke Unit designation.	Business Case for gaps in resources to define as Acute Stroke Unit.	1
	Neurosurgical / Neurointerventional Support	Available on site.	None identified		
	Stroke Center Designation for Fraser Health	No formal designation.	Need to determine for the region, how many 'stroke centers' are required and the sites to be designated.	BCSS ACVS Advisory Group to establish this need.	2

Site	ACVS Requirement	Current State	Gaps in Provision	Action Plan	Priority (1-3)
LEVEL 2 – REGIONAL STROKE CENTRE					
Royal Columbian Hospital (continued) Site Lead for Stroke: Rizalina Bejar, HSM	Stroke Care Monitoring and Evaluation	Nothing formal in place.	Pending the completion of the Stroke Cohort Work and the Stroke Registry.	Abelardo Mayoral from SAPI identifying what can be currently measured in order to establish a set of measureable indicators. Regional Stroke Strategy Team will look at developing a scorecard for stroke that will be consistent with the CSS Indicators and Accreditation Indicators.	2
	Organized Post tPA Care.	Under development.	Review and development of regional stroke order sets and care pathways. Identification of capacity requirements to support site designations / bypass protocols.	As articulated above.	1
LEVEL 3 – PRIMARY STROKE CENTRES					
Abbotsford Regional Hospital Site Lead for Stroke : Jackie Gallaway	Bypass Protocol	HLOC Protocol	Not required for level 3 designation. Logical site to support FCH and MMH.	Identify inpatient capacity requirements to support FCH and MMH. Overall stroke related bed days at MMH and FCH are 3 beds days for stroke, they hyperacute portion of this would be minimal.	2
	CT Scan	24 /7 with combination of on site and on call coverage.	Work towards 24/7 coverage on site.	Strategy in place to establish 24/7 on site coverage.	2
	tPA & Organized Emergency Care	tPA given in ED Utilizing Standardized Order Set.	Require regional order set.	As per RCH.	
	Telestroke Access	Strong neurology support. Could participate in a pool of neurologists to consult.	Telestroke not required.		

Site	ACVS Requirement	Current State	Gaps in Provision	Action Plan	Priority (1-3)
LEVEL 3 – PRIMARY STROKE CENTRES					
Abbotsford Regional Hospital (*continued)* Site Lead for Stroke : Jackie Gallaway	Local Neurology or Internal Medicine Support	3 Neurologists rotating at this site. 24/7 coverage. Intensivists and internal medicine support. Working towards 24/7 intensivist support.	Neurologists could participate in a network to provide Telestroke consult support.	Strategy in place to establish 24/7 on site intensivist coverage. Include ARH Neurologists in planning for regional neurology consult network.	2
	Stroke Unit On Site / Access to Stroke Unit through Diversion Protocols	Stroke Cohort development halted.	Stroke Cohort / Acute Stroke unit would be ideal state.	Identify ability to start with stroke cohort. Inventory gaps in resources to establish acute stroke unit. Baker 2 is the logical unit for the cohort as currently 'neurology' patients are established here. Jackie Gallaway is working on this initiative as of May 10, 2010.	1
	Neurosurgical / Neurointerventional Support	HLOC Protocol	None identified		
	Stroke Center Designation for Fraser Health	Level 3: Primary Stroke Center.	As articulated in this document.		
	Stroke Care Monitoring and Evaluation	Nothing formal in place.	Pending completion of the stroke registry.	As per RCH.	2
	Organized Post tPA Care	Under development	Review and development of regional stroke order sets and care pathways. Identification of capacity requirements to support site designations / bypass protocols.	As articulated above.	1
Burnaby Hospital Site Lead for Stroke: Theresa Guscott, HSM	Bypass Protocol	HLOC Protocol	Not required for level 3 designation		
	CT Scan	24/7 In House and On Call. 30 Minute Response time.	None identified	Working towards 24/7 in house coverage.	2
	tPA & Organized Emergency Care	tPA given in ED Utilizing Standardized Order Set.	Require regional order set.	As per RCH.	1

Site	ACVS Requirement	Current State	Gaps in Provision	Action Plan	Priority (1-3)
LEVEL 3 – PRIMARY STROKE CENTRES					
Burnaby Hospital (*continued)* Site Lead for Stroke: Theresa Guscott, HSM	Telestroke Access	Telestroke not likely required. Could participate in a pool of consultants for Telestroke.	Telestroke not required.		
	Local Neurology or Internal Medicine Support	Neurology Support 24/7 with 2.5 neurologists. IM Support.	None identified		
	Stroke Unit On Site / Access to Stroke Unit through Diversion Protocols	No stroke cohort / stroke unit.	Stroke Cohort / Acute Stroke unit would be ideal state. Data indicates that a 10-12 bed cohort would be goal.	Identify ability to start with stroke cohort. Inventory gaps in resources to establish acute stroke unit.	1
	Neurosurgical / Neurointerventional Support	HLOC Protocol.	None identified		
	Stroke Center Designation for Fraser Health	Level 3: Primary Stroke Center.	As articulated in this document.		
	Stroke Care Monitoring and Evaluation	Nothing formal in place.	Pending completion of the stroke registry.	As per RCH.	2
	Organized Post tPA Care.	Under development.	Review and development of regional stroke order sets and care pathways. Identification of capacity requirements to support site designations / bypass protocols.	As articulated above.	1
Chilliwack General Hospital Site Lead for Stroke: Diane Campbell	Bypass Protocol	HLOC Protocol	Not required for level 3 designation.		
	CT Scan	24/7 In House and On Call.	None identified	Trialing hybrid model on nights to achieve 24/7 in-house coverage.	1
	tPA & Organized Emergency Care	tPA given under Telestroke consultation. Multisite order sets in place.	Regional Protocol to be Developed	As per RCH.	
	Telestroke Access	Yes	VC currently providing Telestroke support		

Site	ACVS Requirement	Current State	Gaps in Provision	Action Plan	Priority (1-3)
LEVEL 3 – PRIMARY STROKE CENTRES					
Chilliwack General Hospital (*continued)* Site Lead for Stroke: Diane Campbell	Local Neurology or Internal Medicine Support	IM Support. Gaps in coverage on some nights and weekends.	No IM coverage on certain nights and weekends.	Recruitment underway for IM coverage 24/7.	1
	Stroke Unit On Site / Access to Stroke Unit through Diversion Protocols	No stroke cohort / stroke unit.	Stroke Cohort / Acute Stroke unit would be ideal state.	Identify ability to start with stroke cohort. Inventory gaps in resources to establish acute stroke unit.	1
	Neurosurgical / Neurointerventional Support	HLOC Protocol	None identified		
	Stroke Center Designation for Fraser Health	Level 3: Primary Stroke Center.	As articulated in this document.		
	Stroke Care Monitoring and Evaluation	Nothing formal in place.	Pending completion of the stroke registry.	As per RCH.	2
	Organized Post tPA Care	Under development.	Review and development of regional stroke order sets and care pathways. Identification of capacity requirements to support site designations / bypass protocols.	As articulated above.	1
Langley Memorial Hospital Site Lead for Stroke: Cheryl Bublitz, HSM	Bypass Protocol	HLOC Protocol	Not required for level 3 designation.		
	CT Scan	Unknown.	Working towards hybrid model. Awaiting confirmation.	Dr. Will Tsiu to follow up and report back to the group.	1
	tPA & Organized Emergency Care	tPA not given	Regional Protocol to be Developed Good Candidate for tPA delivery.	As per RCH.	
	Telestroke Access	No	Good candidate for Telestroke support.	Identify as part of Provincial ACVS Advisory Group.	2
	Local Neurology or Internal Medicine Support	24/7 IM Support.	None identified		

Site	ACVS Requirement	Current State	Gaps in Provision	Action Plan	Priority (1-3)
LEVEL 3 – PRIMARY STROKE CENTRES					
Langley Memorial Hospital (*continued)* Site Lead for Stroke: Cheryl Bublitz, HSM	Stroke Unit On Site / Access to Stroke Unit through Diversion Protocols	No stroke cohort / stroke unit. No diversion protocols.	Stroke Cohort / Acute Stroke unit would be ideal state.	Identify ability to start with stroke cohort. Inventory gaps in resources to establish acute stroke unit.	1
	Neurosurgical / Neurointerventional Support	HLOC Protocol	None identified		
	Stroke Center Designation for Fraser Health	Level 3: Primary Stroke Center	As articulated in this document.		
	Stroke Care Monitoring and Evaluation	Nothing formal in place	Pending completion of the stroke registry.	As per RCH.	2
	Organized Post tPA Care		Review and development of regional stroke order sets and care pathways. Identification of capacity requirements to support site designations / bypass protocols.	As articulated above.	1
Peace Arch Hospital Site Lead for Stroke: Carole Kiselius	Bypass Protocol	HLOC Protocol	Not required for level 3 designation		
	CT Scan	24/7 In House & On Call	May have some call back gaps, need to validate.	Dr. Will Tsiu to follow up and report back to the group.	1
	tPA & Organized Emergency Care	tPA given under Telestroke consultation. Multisite order sets in place.	Regional Protocol to be Developed	As per RCH.	
	Telestroke Access.	Yes	VC currently providing Telestroke support		
	Local Neurology or Internal Medicine Support	IM Support	TBD		
	Stroke Unit On Site / Access to Stroke Unit through Diversion Protocols	No stroke cohort / stroke unit. No diversion protocols.	Stroke Cohort / Acute Stroke unit would be ideal state.	Identify ability to start with stroke cohort. Inventory gaps in resources to establish acute stroke unit.	1

Site	ACVS Requirement	Current State	Gaps in Provision	Action Plan	Priority (1-3)
LEVEL 3 – PRIMARY STROKE CENTRES					
Peace Arch Hospital (*continued)* Site Lead for Stroke: Carole Kiselius	Neurosurgical / Neurointerventional Support	HLOC Protocol.	None identified		
	Stroke Center Designation for Fraser Health	Level 3: Primary Stroke Center	As articulated in this document.		
	Stroke Care Monitoring and Evaluation	Nothing formal in place	Pending completion of the stroke registry.	As per RCH	2
	Organized Post tPA Care	Under development	Review and development of regional stroke order sets and care pathways. Identification of capacity requirements to support site designations / bypass protocols.	As articulated above.	1
Ridge Meadows Hospital Site Lead for Stroke: Bev Dickson	Bypass Protocol	HLOC Protocol	Not required for level 3 designation.		
	CT Scan	Variable access. On call 1630-midnight. No coverage midnight to 0730. 30-45 minute response time.	No coverage Midnight to 0730.	Work towards more consistent coverage.	1
	tPA & Organized Emergency Care	tPA has been given, with drip and ship to RCH. No protocol in place to support this practice.	Regional Protocol to be Developed.	As per RCH.	
	Telestroke Access.	No	Good candidate for Telestroke support.	Identify as part of Provincial ACVS Advisory Group.	2
	Local Neurology or Internal Medicine Support	Unknown	TBD		
	Stroke Unit On Site / Access to Stroke Unit through Diversion Protocols	No stroke cohort / stroke unit. No diversion protocols.	Stroke Cohort / Acute Stroke unit would be ideal state.	Identify ability to start with stroke cohort. Inventory gaps in resources to establish acute stroke unit.	1

Site	ACVS Requirement	Current State	Gaps in Provision	Action Plan	Priority (1-3)
LEVEL 3 – PRIMARY STROKE CENTRES					
Ridge Meadows Hospital (*continued)* Site Lead for Stroke: Bev Dickson	Neurosurgical / Neurointerventional Support	HLOC Protocol	None identified		
	Stroke Center Designation for Fraser Health	Level 3: Primary Stroke Center	As articulated in this document.		
	Stroke Care Monitoring and Evaluation	Nothing formal in place	Pending completion of the stroke registry.	As per RCH.	2
	Organized Post tPA Care.	Unknown	Review and development of regional stroke order sets and care pathways. Identification of capacity requirements to support site designations / bypass protocols.	As articulated above.	1
Surrey Memorial Hospital Site Lead for Stroke: Coralei Still	Bypass Protocol	HLOC Protocol	Not required for level 3 designation.		
	CT Scan	24/7 On site and On Call 2200-0700. Response time 1 hour.	None identified	Response time may need to be addressed.	2
	tPA & Organized Emergency Care	tPA not given.	Regional Protocol to be Developed	As per RCH.	
	Telestroke Access.	No.	Good candidate for Telestroke support.	Identify as part of Provincial ACVS Advisory Group.	2
	Local Neurology or Internal Medicine Support	24/7 Neurology Coverage. IM Support with some gaps.	None identified		
	Stroke Unit On Site / Access to Stroke Unit through Diversion Protocols	Stroke Cohort in Development.	Gaps in resources need to be identified. No destination protocols in place.	Coralei Still reviewed CSS standards for acute stroke unit. Michelle de Moor to review. Next steps will be to develop business case to address gaps in coverage. SMH may also require increased capacity, based on current volumes and activity. Will articulate this in projected requirements. New unit planned for SMH includes a 36 bed neurology unit.	1

Site	ACVS Requirement	Current State	Gaps in Provision	Action Plan	Priority (1-3)
LEVEL 3 – PRIMARY STROKE CENTRES					
Surrey Memorial Hospital (*continued)* Site Lead for Stroke: Coralei Still	Neurosurgical / Neurointerventional Support	HLOC Protocol	None identified		
	Stroke Center Designation for Fraser Health	Level 3: Primary Stroke Center	As articulated in this document.		
	Stroke Care Monitoring and Evaluation	Nothing formal in place	Pending completion of the stroke registry.	As per RCH.	2
	Organized Post tPA Care.	Unknown	Review and development of regional stroke order sets and care pathways. Identification of capacity requirements to support site designations / bypass protocols.	As articulated above.	1
Level 4: Non-tPA Enabled Sites	ACVS Requirement	Current State	Gaps in Provision	Action Plan	Priority (1-3)
LEVEL 4 – NON-tPA ENABLED SITES					
Eagle Ridge Hospital Site Lead for Stroke: Marnie Killingsworth	Bypass Protocol	HLOC Protocol	Bypass protocol with RCH supporting needs to be developed.	Identification of capacity requirements at RCH to support this site. Data around volumes at ERH. Development of bypass protocols in partnership with BCAS and through provincial ACVS Advisory group work.	2
	CT Scan	24/7 In House and On Call. 15 Minute response time.	Not required		
	tPA & Organized Emergency Care	tPA not given	Not required		
	Telestroke Access.	No	Not required		
	Local Neurology or Internal Medicine Support	Unknown	Not required		
	Stroke Unit On Site / Access to Stroke Unit through Diversion Protocols	No stroke cohort / stroke unit. No diversion protocols.	Not required		

Site	ACVS Requirement	Current State	Gaps in Provision	Action Plan	Priority (1-3)
LEVEL 4 – NON-tPA ENABLED SITES					
Eagle Ridge Hospital ***(continued)*** Site Lead for Stroke: Marnie Killingsworth	Neurosurgical / Neurointerventional Support	HLOC Protocol.	Not required		
	Stroke Center Designation for Fraser Health	Level 4: Non tPA Enabled Site	As articulated in this document.		
	Stroke Care Monitoring and Evaluation	Nothing formal in place	Pending completion of the stroke registry.		
	Organized Post tPA Care.	No	Not required		
Delta Hospital Site Lead for Stroke: Bev Matushewski	Bypass Protocol	HLOC Protocol	Bypass Protocol with SMH supporting needs to be developed.	Identification of capacity requirements at SMH to support this site. Data volumes around activity at Delta. Development of bypass protocols in partnership with BCAS and through provincial ACVS Advisory group work.	2
	CT Scan	On Call.	Not required		
	tPA & Organized Emergency Care	tPA not given.	Not required		
	Telestroke Access.	No.	Not required		
	Local Neurology or Internal Medicine Support	Unknown.	Not required		
	Stroke Unit On Site / Access to Stroke Unit through Diversion Protocols	No stroke cohort / stroke unit. No diversion protocols.	Not required		
	Neurosurgical / Neurointerventional Support	HLOC Protocol.	Not required		
	Stroke Center Designation for Fraser Health	No.	As articulated in this document.		
	Stroke Care Monitoring and Evaluation	Nothing formal in place.	Pending completion of the stroke registry.	As per RCH.	2
	Organized Post tPA Care.	Unknown.	Not required		

Site	ACVS Requirement	Current State	Gaps in Provision	Action Plan	Priority (1-3)
LEVEL 4 – NON-tPA ENABLED SITES					
Fraser Canyon Hospital Site Lead for Stroke: Catherine Weibe	Bypass Protocol	HLOC Protocol	Bypass Protocol with ARH supporting needs to be developed.	Identification of capacity requirements at ARHH to support this site. Data volumes around activity at FCH. Development of bypass protocols in partnership with BCAS and through provincial ACVS Advisory group work.	2
	CT Scan	Unknown.	Not required		
	tPA & Organized Emergency Care	tPA not given.	Not required		
	Telestroke Access.	No.	Not required		
	Local Neurology or Internal Medicine Support	Unknown.	Not required		
	Stroke Unit On Site / Access to Stroke Unit through Diversion Protocols	No stroke cohort / stroke unit. No diversion protocols.	Not required		
	Neurosurgical / Neurointerventional Support	HLOC Protocol.	Not required		
	Stroke Center Designation for Fraser Health	No.	As articulated in this document.		
	Stroke Care Monitoring and Evaluation	Nothing formal in place.	Pending completion of the stroke registry.	As per RCH.	2
	Organized Post tPA Care.	Unknown.	Not required		
Mission Memorial Hospital Site Lead for Stroke: Penny Hill	Bypass Protocol	HLOC Protocol	Bypass Protocol with ARH supporting needs to be developed.	Identification of capacity requirements at AMH to support this site. Data volumes around activity at MMH. Development of bypass protocols in partnership with BCAS and through provincial ACVS Advisory group work.	2
	CT Scan	Unknown.	Not required		
	tPA & Organized Emergency Care	tPA not given.	Not required		
	Telestroke access.	No.	Not required		

Site	ACVS Requirement	Current State	Gaps in Provision	Action Plan	Priority (1-3)
LEVEL 4 – NON-tPA ENABLED SITES					
Mission Memorial Hospital (*continued)* Site Lead for Stroke: Penny Hill	Local Neurology or Internal Medicine Support	Unknown.	Not required		
	Stroke Unit On Site / Access to Stroke Unit through Diversion Protocols	No stroke cohort / stroke unit. No diversion protocols.	Not required		
	Neurosurgical / Neurointerventional Support	HLOC Protocol.	Not required		
	Stroke Center Designation for Fraser Health	No.	As articulated in this document.		
	Stroke Care Monitoring and Evaluation	Nothing formal in place.	Pending completion of the stroke registry.	As per RCH.	2
	Organized Post tPA Care.	Unknown.	Not required		

FRASER HEALTH

Resource Estimates

MODELING RESOURCE INVESTMENT REQUIRED

Implementing Optimal Stroke Care in Fraser Health
Modeling Estimated Resources Required

	Year 1 (2011/12)	Year 2 (2012/13)	Year 3 (2013/14)	3-Year Total	Year 4 (2014/15)	Year 5 (2015/16)	Year 6 (2016/17)	Year 7 (2017/18)
The cost estimates identified in this table are order of magnitude estimates based on a number of data modeling assumptions related to moving the BC health system to optimal stroke care over the next seven years, as detailed in the text of the Provincial Plan. The modeling is based on a staged implementation approach. The actual timing of implementation will likely vary for each Health Authority.								
Change Management Resource Requirements								
Provincial				**$0**				
Regional	$606,446	$621,640	$637,289	**$1,865,375**	$523,764	$508,944	$490,623	$470,744
Sub-Total Change Management	**$606,446**	**$621,640**	**$637,289**	**$1,865,375**	**$523,764**	**$508,944**	**$490,623**	**$470,744**
Modeling for Optimal Care - Operational Areas								
TIA Rapid Assessment Services (1)								
Proportion of Patients Receiving Optimal Care	19.6%	30%	40%		60%	80%	80%	80%
Cost Estimate	$0	$57,534	$115,973	**$173,507**	$236,283	$363,707	$374,618	$385,856
Enhanced tPA Utilization / Telestroke (2)								
Activity	*Plan for expansion*	*Implement at 5 consulting sites*	*Implement at 9 referring sites*		*Implement at 8 referring sites*	*Ongoing operational costs* →		
% Receiving tPA (assumption)	3.74%	3.74%	6.00%		8.00%	10.00%	10.00%	10.00%
Cost Estimate	$202,306	$291,869	$655,957	**$1,150,133**	$734,980	$483,437	$484,920	$489,631
Organized Stroke Care (3)								
Proportion of Patients Receiving Optimal Care	3.7%	25%	50%		75%	80%	80%	80%
Cost Estimate	$0	$1,167,587	$2,616,310	**$3,783,897**	$4,150,905	$4,575,390	$4,712,651	$4,854,031
Early Home Supported Discharge (4)								
Proportion of Patients Receiving Optimal Care	0%	0%	10%		20%	30%	37%	37%
Cost Estimate	$0	$0	$554,810	**$554,810**	$1,142,908	$1,765,792	$2,243,145	$2,310,439
Sub-Total Modeling for Optimal Care	**$202,306**	**$1,516,990**	**$3,943,050**	**$5,662,346**	**$6,265,075**	**$7,188,325**	**$7,815,334**	**$8,039,957**
Current Funding for the TIA Rapid Assessment Services ending after 2010//11	$100,000			**$100,000**				
Additional Funding to Maintain Current Capacity for the TIA Rapid Assessment Services		$103,000	$106,090	**$209,090**	$109,273	$112,551	$115,927	$119,405
Order of Magnitude Estimate	**$908,753**	**$2,241,630**	**$4,686,429**	**$7,836,812**	**$6,898,112**	**$7,809,821**	**$8,421,885**	**$8,630,106**

Notes:

(1) Optimal care associated with TIA Rapid Assessment Services is defined as access within 72 hours for 80% of TIA/minor stroke patients in the province. Optimal care is currently being provided to an estimated 19.6% of TIA/minor stroke patients living in the geographic boundaries of FH.

(2) Optimal care associated with tPA utilization is defined as receipt by a maximum of 10% of incident ischemic stroke patients. tPA is currently being utilized by 3.74% of the incident ischemic stroke patients living within the geographic boundaries of FH.

(3) Optimal care assumes that 80% of stroke patients admitted to acute care will have access to organized stroke care. An estimated 3.7% of stroke patients living within the geographic boundaries of FH are currently receiving organized stroke care (at Surrey Memorial Hospital).

(4) An early home-supported discharge (EHSD) team is comprised of "physiotherapists and occupational therapists supported by speech therapists, physicians, nurses, and social workers whose teamwork is coordinated by regular meetings. Often the EHSD begins with one or more pre-discharge home visits, continues the day of discharge, and goes on with more home sessions per week based on a patient-held recovery plan. [However,] it should be emphasized that EHSD is not considered an alternate to a stroke unit". Larsen T, Olsen TS, Sorensen J. Early home-supported discharge of stroke patients: a health technology assessment. International Journal of Technology Assessment in Health Care. 2006; 22(3): 313-20.

The literature suggests that an average of 37% of stroke patients admitted to acute care would be eligible for EHSD. Winkel A, Ekdahl C, Gard G. Early discharge to therapy-based rehabilitation at home in patients with stroke: a systematic review. Physical Therapy Reviews. 2008; 13(3): 167-87.

No patients living within the geographic boundaries are currently receiving EHSD.

Winkel A, Ekdahl C, Gard G. Early discharge to therapy-based rehabilitation at home in patients with stroke: a systematic review. Physical Therapy Reviews. 2008; 13(3): 167-87.

INDICATORS AND METRICS

By Health Authority and HSDA

INDICATORS AND METRICS

The BC Stroke Strategy Measurement and Evaluation Working Group have suggested five key indicators for tracking progress on ACVS care in the province as follows:

1. TIA volumes
    - Increase the volume of TIA / non-hospitalized strokes processed in TIA Rapid Assessment Clinics by **50%** between 2009/10 and 2013/14
2. tPA utilization[1]
    - Increase the number of incident ischemic stroke patients appropriately receiving tPA to **10%** between 2008/09 and 2013/14
3. Incidence rate
    - Reduce the age-standardized incidence rate of both ischemic and hemorrhagic stroke by 10% between 2008/09 and 2013/14
4. Acute care days
    - Reduce acute care days for discharges in which an ischemic stroke is the principal diagnosis by **10%** between 2008/09 and 2013/14 (this includes a combination of reduced discharges and reduced average length of stay)
5. Death and dependency
    - Reduce the proportion of patients who die in hospital or are sent to a long- term care facility after being admitted/discharged (principal diagnosis) for ischemic stroke. *If only one composite measure is used to assess progress in stroke care, it would be this overall measure of death and dependency*

The following sections include:

– trend data for Fraser Health for each of these five indicators; and

– trend data for three of the five indicators (incidence rate, acute care days, and death and dependency) for

    o Fraser East HSDA

    o Fraser North HSDA

    o Fraser South HSDA

The majority of this data is from the updated Acute Cerebrovascular Syndrome (ACVS) Registry, with the exception of data for Indicator #1 which is provided by the health authorities.

[1] The original goal set prior to information on current results was 5%. Given a provincial average of 4.27%, the goal was reset at 10% in 2008/09.

FRASER HEALTH

Indicators and Metrics

FRASER HEALTH
INDICATORS AND METRICS AS OF NOVEMBER 2010

Acute Cerebrovascular Syndrome
Adults* Residing in the Fraser Health Authority
2001/02 to 2008/09

	Fiscal Year								% Change
	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	01/02 to 08/09
Number of Incident ACVS Patients									
Hospitalized Ischemic Stroke	1,217	1,230	1,167	1,196	1,199	1,229	1,248	1,177	-3.3%
Hospitalized Hemorrhagic Stroke	278	256	248	251	278	275	298	292	5.0%
Sub-total	**1,495**	**1,486**	**1,415**	**1,447**	**1,477**	**1,504**	**1,546**	**1,469**	**-1.7%**
Hospitalized TIA	349	355	311	327	395	340	382	416	19.2%
Non-hospitalized TIA/Stroke	991	1,198	1,169	1,247	1,322	1,264	1,444	1,508	52.2%
Sub-total	**1,340**	**1,553**	**1,480**	**1,574**	**1,717**	**1,604**	**1,826**	**1,924**	**43.6%**
Number of Prevalent ACVS Patients									
Hospitalized Ischemic Stroke	6,676	6,940	7,157	7,331	7,537	7,758	7,899	8,086	21.1%
Hospitalized Hemorrhagic Stroke	1,396	1,464	1,549	1,640	1,741	1,852	1,969	2,081	49.1%
Sub-total	**8,072**	**8,404**	**8,706**	**8,971**	**9,278**	**9,610**	**9,868**	**10,167**	**26.0%**
Hospitalized TIA	2,305	2,441	2,541	2,627	2,768	2,827	2,939	3,059	32.7%
Non-hospitalized TIA/Stroke	6,496	7,087	7,647	8,213	8,773	9,332	10,017	10,720	65.0%
Sub-total	**8,801**	**9,528**	**10,188**	**10,840**	**11,541**	**12,159**	**12,956**	**13,779**	**56.6%**
Age-Standardized Incidence / 1,000 Population									
Hospitalized Ischemic Stroke	1.025	0.999	0.913	0.909	0.874	0.865	0.845	0.771	-24.8%
Hospitalized Hemorrhagic Stroke	0.227	0.203	0.188	0.184	0.198	0.188	0.201	0.188	-17.1%
Sub-total	**1.260**	**1.210**	**1.108**	**1.100**	**1.080**	**1.061**	**1.053**	**0.966**	**-23.4%**
Hospitalized TIA	0.289	0.284	0.238	0.244	0.282	0.236	0.253	0.271	-6.5%
Non-hospitalized TIA/Stroke	0.834	0.976	0.921	0.953	0.977	0.905	0.995	1.007	20.7%
Age-Standardized Prevalence / 1,000 Population									
Hospitalized Ischemic Stroke	5.277	5.301	5.269	5.224	5.192	5.154	5.065	4.993	-5.4%
Hospitalized Hemorrhagic Stroke	1.103	1.124	1.147	1.177	1.213	1.247	1.285	1.308	18.6%
Sub-total	**6.380**	**6.425**	**6.415**	**6.401**	**6.404**	**6.400**	**6.350**	**6.301**	**-1.2%**
Hospitalized TIA	1.822	1.865	1.870	1.870	1.901	1.870	1.871	1.880	3.2%
Non-hospitalized TIA/Stroke	5.371	5.673	5.911	6.161	6.359	6.518	6.756	6.957	29.5%
Conversion Rate from TIA/Non-hospitalized Stroke to Hospitalized Stroke									
90-Day Conversion Rate	3.49%	3.05%	2.02%	2.70%	2.64%	3.01%	1.76%		-49.7%
365-Day Conversion Rate	5.12%	4.38%	3.76%	4.28%	3.96%	4.41%	3.29%		-35.8%
Utilization of tPA by Incident Acute Ischemic Stroke Patients									
Number Receiving tPA						30	32	44	
Total Number						1,229	1,248	1,177	
Proportion of Incident Hospitalized AIS Patients Receiving tPA						2.44%	2.56%	3.74%	
Utilization of Acute Care by Incident Ischemic Stroke Patients									
Discharges	1,217	1,230	1,167	1,196	1,199	1,229	1,248	1,177	-3.3%
ALOS	30.94	32.84	29.55	28.59	29.72	28.65	28.17	24.35	-21.3%
Patient Days	37,653	40,394	34,490	34,199	35,633	35,211	35,155	28,661	-23.9%
Utilization of Acute Care by Incident Hemorrhagic Stroke Patients									
Discharges	278	256	248	251	278	275	298	292	5.0%
ALOS	37.87	36.23	31.71	34.51	35.85	41.27	42.61	28.44	-24.9%
Patient Days	10,529	9,274	7,865	8,662	9,965	11,350	12,698	8,305	-21.1%
Discharge Disposition following Acute Admissions for Incident Ischemic Stroke Patients									
Died	26.5%	24.6%	26.1%	22.7%	23.5%	26.0%	23.5%	21.8%	-17.5%
Discharged to Home	45.4%	47.2%	44.8%	48.6%	44.4%	45.9%	47.1%	49.0%	8.1%
Home with Support Services	9.9%	9.6%	10.5%	10.9%	12.2%	10.1%	10.9%	8.9%	-10.3%
Continuing Care Facility	16.3%	16.6%	16.6%	16.3%	16.3%	14.6%	15.0%	13.7%	-15.9%
Other	2.0%	2.0%	1.9%	1.6%	3.6%	3.4%	3.5%	6.5%	231.7%
Discharge Disposition following Acute Admissions for Incident Hemorrhagic Stroke Patients									
Died	37.8%	39.5%	37.1%	33.5%	32.0%	30.9%	35.2%	34.9%	-7.5%
Discharged to Home	41.7%	41.0%	42.3%	45.4%	43.5%	43.3%	42.6%	44.5%	6.7%
Home with Support Services	4.7%	6.3%	8.9%	5.2%	6.5%	8.4%	6.0%	3.4%	-26.8%
Continuing Care Facility	10.8%	10.2%	8.1%	10.0%	14.0%	12.7%	11.7%	8.6%	-20.7%
Other	5.0%	3.1%	3.6%	6.0%	4.0%	4.7%	4.4%	8.6%	70.0%
Mortality Following an Incident Stroke									
Hospitalized Ischemic Stroke									
Crude 30-day In-hospital Mortality Rate	20.0%	18.9%	20.2%	18.7%	17.7%	20.4%	18.5%	17.6%	-11.9%
Crude 31-365 Day Mortality Rate in 30-day In-hospital Survivors	19.3%	19.0%	20.0%	18.9%	21.6%	22.5%	19.0%	20.8%	7.9%
Hospitalized Hemorrhagic Stroke									
Crude 30-day In-hospital Mortality Rate	32.4%	36.7%	34.3%	31.1%	29.5%	26.9%	31.2%	31.2%	-3.7%
Crude 31-365 Day Mortality Rate in 30-day In-hospital Survivors	15.4%	9.9%	16.0%	10.4%	13.8%	17.4%	16.6%	15.4%	0.0%

Grey Shading = Not Applicable/Available

* Age 20 and older

FRASER HEALTH
INDICATORS AND METRICS

The BC Stroke Strategy Measurement and Evaluation Working Group have suggested five key indicators for tracking progress on ACVS care in the province. The following includes trend data for **Fraser Health** for each of these five indicators. The majority of this data is from the updated Acute Cerebrovascular Syndrome (ACVS) Registry, with the exception of data for Indicator #1 which is provided by the Health Authorities. Note that the geographic location is based on the patient's residence, not necessarily the location of their treatment. The only exception to this is Indicator #1 in which the geographic location is based on the location of the clinic.

The focus of the graphs and charts is on provincial trends for the five key ACVS indicators.

Indicator #1 – TIA Volumes

Increase the volume of TIA/non-hospitalized strokes processed in TIA Rapid Assessment Clinics by **50%** between 2009/10 and 2013/14 (*data source*: provided by Health Authorities).

TIA Rapid Assessment Clinics
In British Columbia by Health Authority
2009/10 Estimated

	FHA	BC Total
New Patients Seen	1,364	5,215
TIA/Stroke Patients Seen	854	2,749
Mimic Rate	37.4%	47.3%
Referral Source		
GP/Specialist	23.2%	39.1%
Emergency Department	72.9%	42.9%
Other	3.9%	17.9%
Mean Wait Time		
From Event to 1st Appointment (in days)	4.40	5.26
From Referral to 1st Appointment (in days)	3.18	4.44
# of Patients Seen Within 48 Hours	349	980
% Seen Within 48 Hours	25.6%	18.8%

Note: Does not include data from LGH

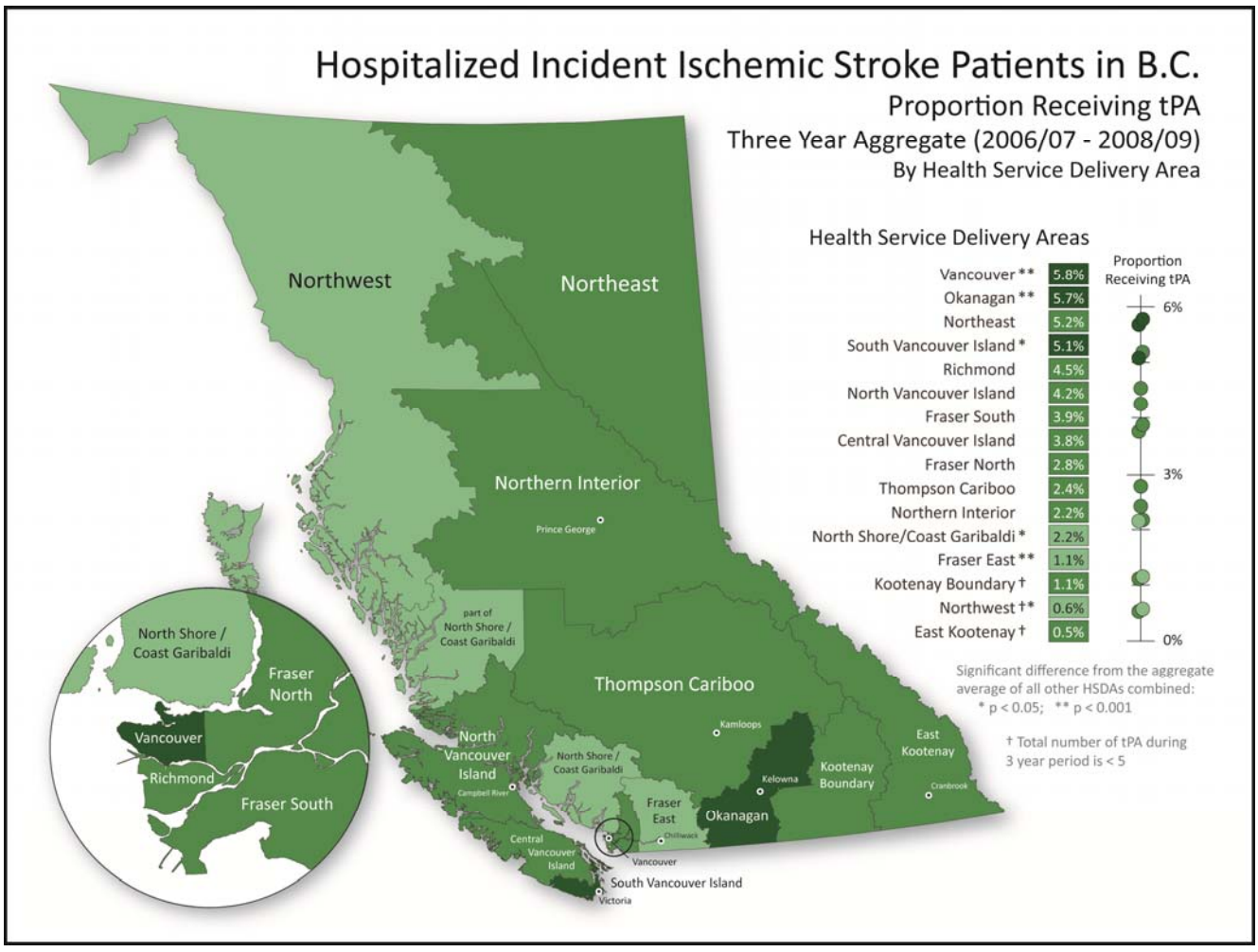
Indicator #2 – tPA Utilization

Increase the number of incident ischemic stroke patients appropriately receiving tPA to **10%** between 2008/09 and 2013/14. [*Data source:* proportion is based on number of incident hospitalized ischemic stroke patients (based on the updated ACVS Registry definition) with intervention code 1.ZZ.35.HA-C1 (Pharmacotherapy, total body, percutaneous approach, [intramuscular, intravenous, subcutaneous, intradermal] using antithrombotic agent). This use of this code has only been mandatory in BC since 2006/07.]

In Fraser Health, utilization of tPA by incident hospitalized acute ischemic stroke (AIS) patients from 2006/07 to 2008/09 is as follows:

- 30 of 1,229 incident hospitalized AIS patients received tPA or 2.44% in 2006/07
- 32 of 1,248 incident hospitalized AIS patients received tPA or 2.56% in 2007/08
- 44 of 1,177 incident hospitalized AIS patients received tPA or 3.74% in 2008/09

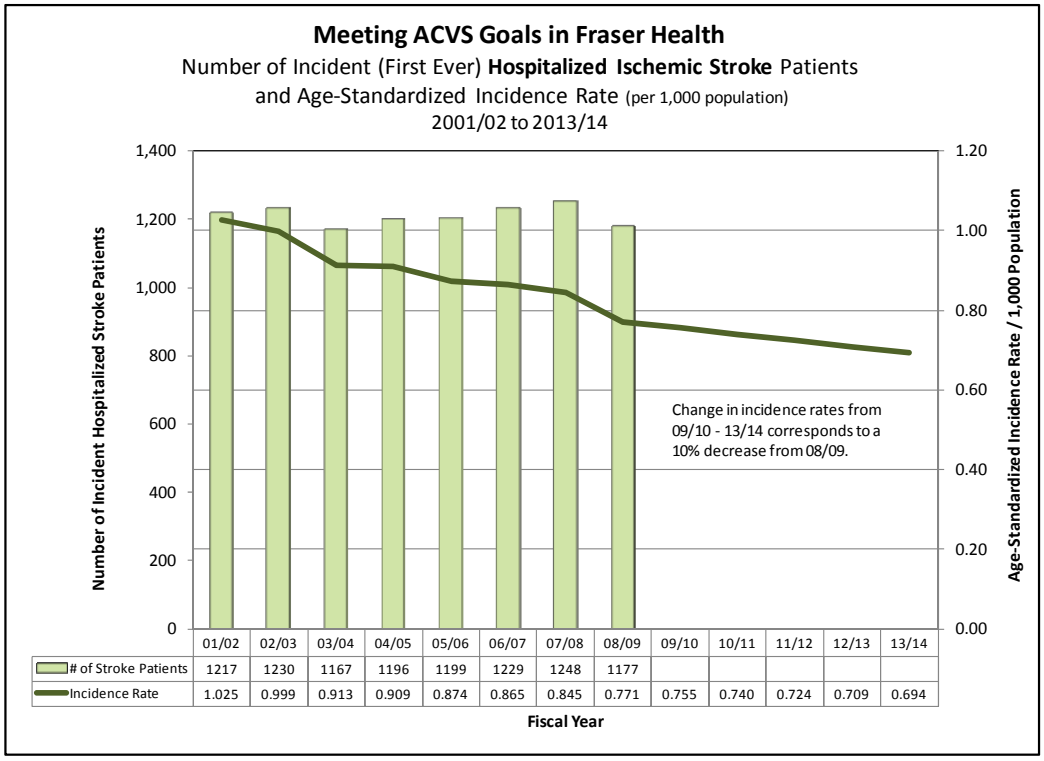
In BC, there is considerable variation in use of tPA at the regional level, with a significantly higher proportion of AIS patients living in Vancouver, Okanagan and South Vancouver Island Health Service Delivery Areas (HSDAs) receiving tPA. Patients with an incident ischemic stroke living in the Fraser East, North Shore/Coast Garibaldi and Northwest HSDAs have a significantly lower probability of receiving tPA (see map below).



Indicator #3 – Incidence Rate

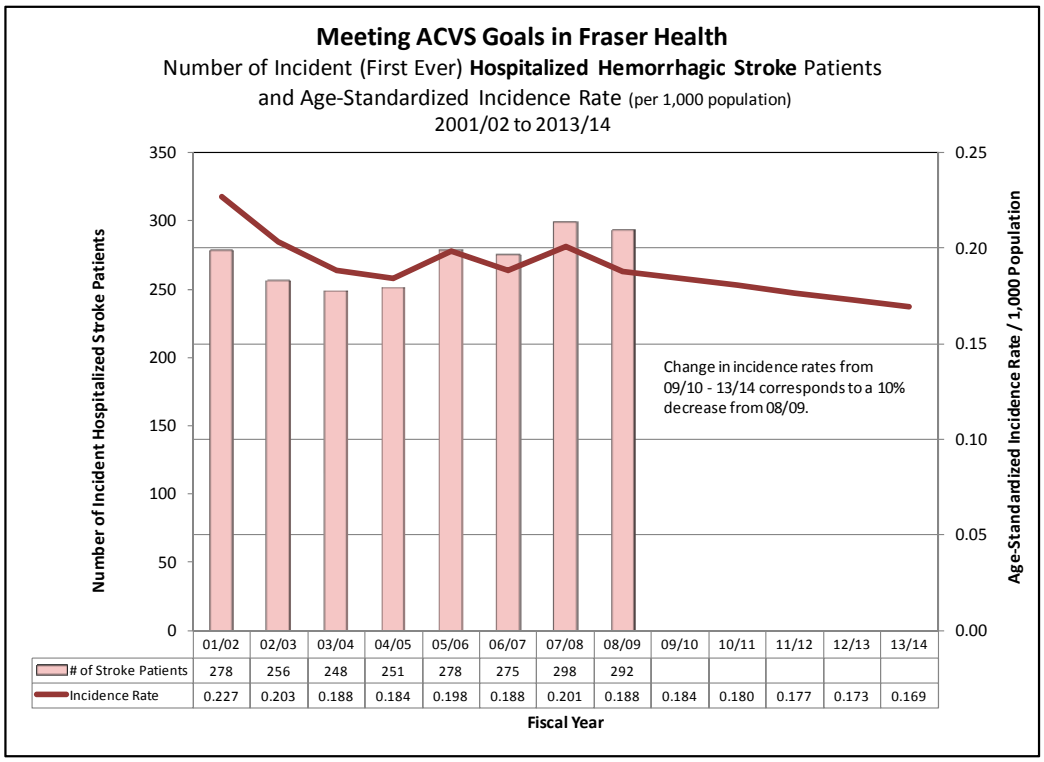
Reduce the age-standardized incidence rate of both ischemic and hemorrhagic stroke by **10%** between 2008/09 and 2013/14 (*data source:* updated ACVS Registry).

Fraser Health Authority – Incident Hospitalized Ischemic Stroke Patients



	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11	11/12	12/13	13/14
# of Stroke Patients	1217	1230	1167	1196	1199	1229	1248	1177					
Incidence Rate	1.025	0.999	0.913	0.909	0.874	0.865	0.845	0.771	0.755	0.740	0.724	0.709	0.694

Fraser Health Authority – Incident Hospitalized Hemorrhagic Stroke Patients



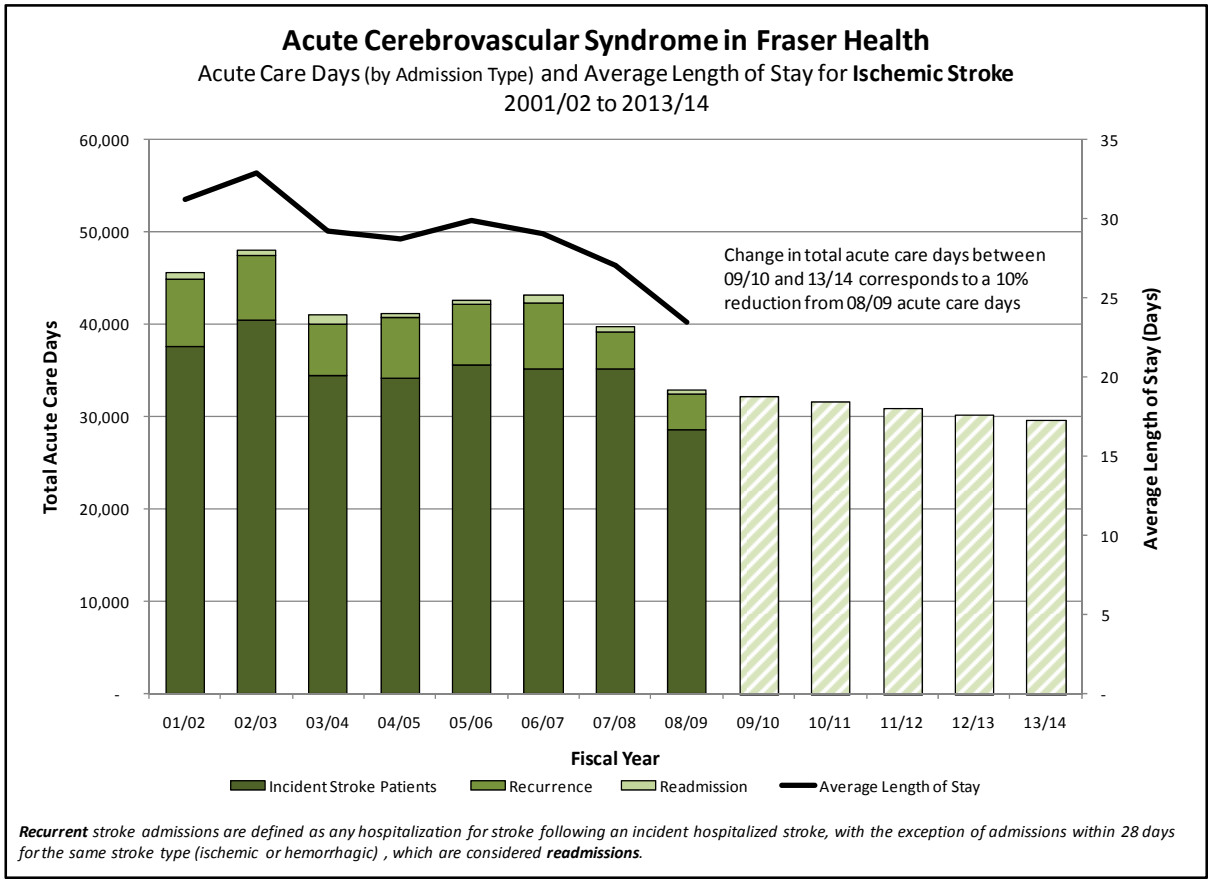
	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11	11/12	12/13	13/14
# of Stroke Patients	278	256	248	251	278	275	298	292					
Incidence Rate	0.227	0.203	0.188	0.184	0.198	0.188	0.201	0.188	0.184	0.180	0.177	0.173	0.169

Indicator #4 – Acute Care Days

Reduce acute care days for discharges in which an ischemic stroke is the principal diagnosis by **10%** between 2008/09 and 2013/14 (this includes a combination of reduced discharges and reduced average length of stay).

> *Data Source:* Updated ACVS Registry for incident, re-admit and recurrent ischemic stroke discharges. Link to the Discharge Abstract Database (DAD) for number of hospital days associated with these discharges. **Recurrent** stroke admissions are defined as any hospitalization for stroke following an incident hospitalized stroke, with the exception of admissions within 28 days for the same stroke type (ischemic or hemorrhagic), which are considered **readmissions**.

Fraser Health Authority – Acute Care Days and ALOS for Ischemic Stroke Patients



***Recurrent** stroke admissions are defined as any hospitalization for stroke following an incident hospitalized stroke, with the exception of admissions within 28 days for the same stroke type (ischemic or hemorrhagic) , which are considered **readmissions**.*

Hospitalization and ALOS for Stroke
Adults* Residing in Fraser Health Authority
2001/02 to 2008/09

	Fiscal Year							
	2001/02	**2002/03**	**2003/04**	**2004/05**	**2005/06**	**2006/07**	**2007/08**	**2008/09**
Number of Stroke Hospitalizations								
Number of Incident Stroke Patients								
Hospitalized Ischemic Stroke	1,217	1,230	1,167	1,196	1,199	1,229	1,248	1,177
Hospitalized Hemorrhagic Stroke	278	256	248	251	278	275	298	292
Readmission								
Hospitalized Ischemic Stroke	32	28	22	36	17	36	27	32
Hospitalized Hemorrhagic Stroke	5				6		5	6
Recurrence								
Hospitalized Ischemic Stroke	213	201	212	200	208	221	197	194
Hospitalized Hemorrhagic Stroke	24	25	26	28	27	25	26	19
Total Hospitalized Ischemic Stroke	**1,462**	**1,459**	**1,401**	**1,432**	**1,424**	**1,486**	**1,472**	**1,403**
Total Hospitalized Hemorrhagic Stroke	**307**	**283**	**276**	**282**	**311**	**302**	**329**	**317**
Total Number of Stroke Hospitalizations	**1,769**	**1,742**	**1,677**	**1,714**	**1,735**	**1,788**	**1,801**	**1,720**
Average Length of Stay in Acute Care								
Incident Stroke Patients								
Hospitalized Ischemic Stroke	30.94	32.84	29.55	28.59	29.72	28.65	28.17	24.35
Hospitalized Hemorrhagic Stroke	37.87	36.23	31.71	34.51	35.85	41.27	42.61	28.44
Readmission								
Hospitalized Ischemic Stroke	22.06	18.93	40.18	11.89	23.88	25.39	23.63	16.63
Hospitalized Hemorrhagic Stroke	9.80	124.50	55.50	54.00	46.50	5.00	11.40	23.50
Recurrence								
Hospitalized Ischemic Stroke	34.20	35.16	26.34	32.42	31.28	31.96	20.19	19.25
Hospitalized Hemorrhagic Stroke	21.71	38.12	22.88	22.54	29.63	28.44	45.31	28.79
Total Hospitalized Ischemic Stroke	**31.22**	**32.89**	**29.24**	**28.71**	**29.88**	**29.06**	**27.02**	**23.47**
Total Hospitalized Hemorrhagic Stroke	**36.15**	**37.02**	**31.05**	**33.53**	**35.51**	**39.97**	**42.35**	**28.37**
Total Number of Stroke Hospitalizations	**32.08**	**33.56**	**29.53**	**29.50**	**30.89**	**30.91**	**29.82**	**24.37**
Days in Acute Care								
Number of Incident Stroke Patients								
Hospitalized Ischemic Stroke	37,653	40,394	34,490	34,199	35,633	35,211	35,155	28,661
Hospitalized Hemorrhagic Stroke	10,529	9,274	7,865	8,662	9,965	11,350	12,698	8,305
Readmission								
Hospitalized Ischemic Stroke	706	530	884	428	406	914	638	532
Hospitalized Hemorrhagic Stroke	49	249	111	162	279	10	57	141
Recurrence								
Hospitalized Ischemic Stroke	7,285	7,068	5,585	6,483	6,507	7,064	3,978	3,734
Hospitalized Hemorrhagic Stroke	521	953	595	631	800	711	1,178	547
Total Days - Hospitalized Ischemic Stroke	**45,644**	**47,992**	**40,959**	**41,110**	**42,546**	**43,189**	**39,771**	**32,927**
Total Days - Hospitalized Hemorrhagic Stroke	**11,099**	**10,476**	**8,571**	**9,455**	**11,044**	**12,071**	**13,933**	**8,993**
Total Days	**56,743**	**58,468**	**49,530**	**50,565**	**53,590**	**55,260**	**53,704**	**41,920**

* Age 20 and older

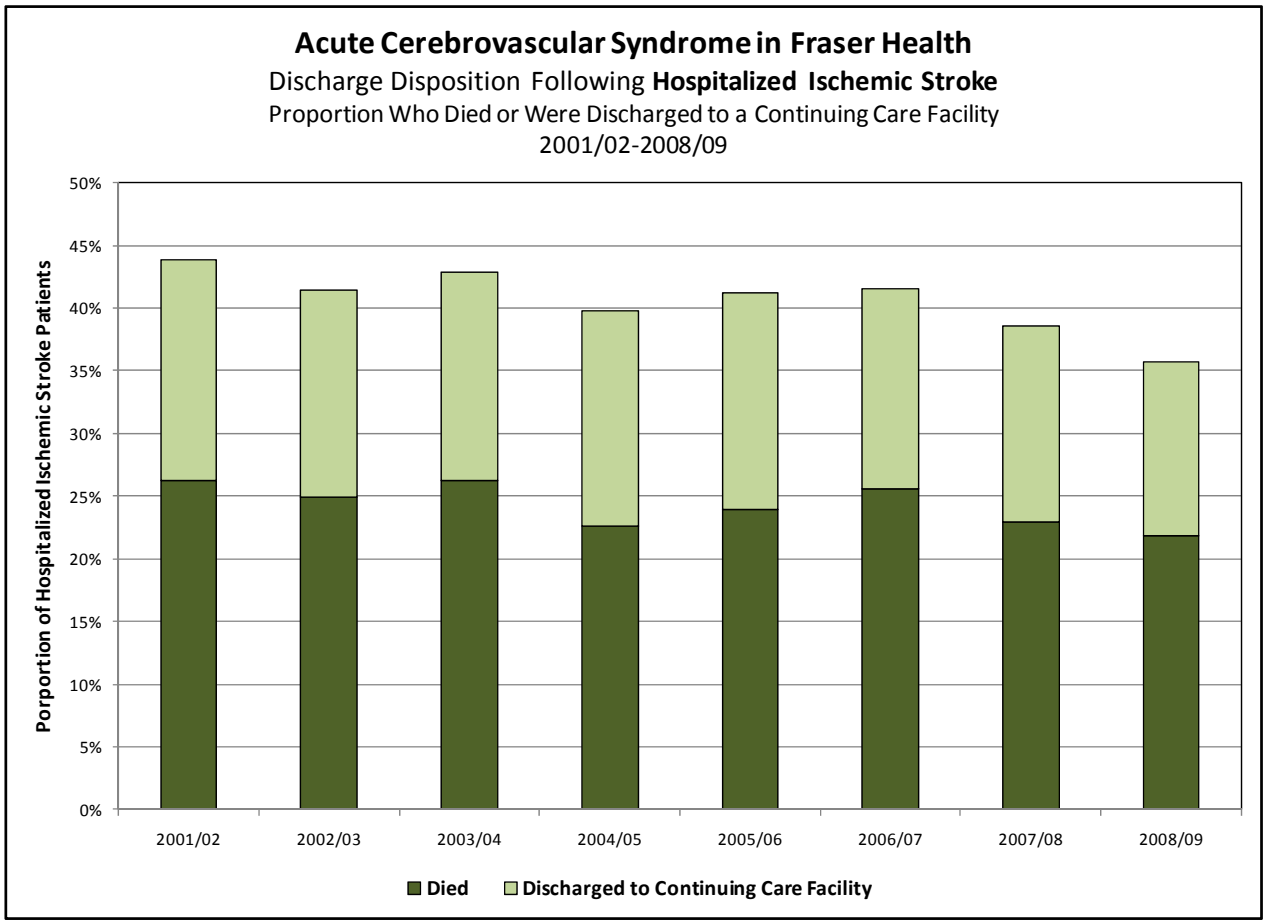
Recurrent stroke admissions *are defined as any hospitalization for stroke following an incident hospitalized stroke, with the exception of admissions within 28 days for the same stroke type (ischemic or hemorrhagic), which are considered* ***readmissions****.*

Indicator #5 – Death and Dependency

Reduce the proportion of patients who die in hospital or are sent to a long- term care facility after being admitted/discharged (principal diagnosis) for ischemic stroke. *If only one composite measure is used to assess progress in stroke care, it would be this overall measure of death and dependency.*

> *Data Source:* Updated ACVS Registry for hospitalized (incident, readmission and recurrent) ischemic stroke discharges. Discharge Abstract Database (DAD) for discharge disposition ('died', 'discharged to a Continuing Care facility').

Fraser Health Authority – Discharge Disposition for Hospitalized Ischemic Stroke



Indicator #5 – Death and Dependency (continued)

Fraser Health Authority – Discharge Disposition Data Trends

Discharge Disposition Following a Hospitalization for Stroke

Patient Died or Was Discharged to a Continuing Care Facility

Adults* Residing in Fraser Health Authority

2001/02 to 2008/09

	Fiscal Year							
	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09
Number of Stroke Hospitalizations								
Number of Incident Stroke Patients								
Hospitalized Ischemic Stroke	1,217	1,230	1,167	1,196	1,199	1,229	1,248	1,177
Hospitalized Hemorrhagic Stroke	278	256	248	251	278	275	298	292
Readmission								
Hospitalized Ischemic Stroke	32	28	22	36	17	36	27	32
Hospitalized Hemorrhagic Stroke	5	[redacted]			6	[redacted]	5	6
Recurrence								
Hospitalized Ischemic Stroke	213	201	212	200	208	221	197	194
Hospitalized Hemorrhagic Stroke	24	25	26	28	27	25	26	19
Total Hospitalized Ischemic Stroke	**1,462**	**1,459**	**1,401**	**1,432**	**1,424**	**1,486**	**1,472**	**1,403**
Total Hospitalized Hemorrhagic Stroke	**307**	**283**	**276**	**282**	**311**	**302**	**329**	**317**
Total Number of Stroke Hospitalizations	**1,769**	**1,742**	**1,677**	**1,714**	**1,735**	**1,788**	**1,801**	**1,720**
Discharge Disposition - Number								
Incident Stroke Patients								
Hospitalized Ischemic Stroke								
Died	322	303	305	271	282	319	293	257
Discharged to a Continuing Care Facility	198	204	194	195	196	180	187	161
Hospitalized Hemorrhagic Stroke								
Died	105	101	92	84	89	85	105	102
Discharged to a Continuing Care Facility	30	26	20	25	39	35	35	25
Readmission								
Hospitalized Ischemic Stroke								
Died	6	[redacted]				13	[redacted]	6
Discharged to a Continuing Care Facility	7			6		5		5
Hospitalized Hemorrhagic Stroke								
Died	-	-	-	-	[redacted]	-	-	[redacted]
Discharged to a Continuing Care Facility	-	-	-	-			-	
Recurrence								
Hospitalized Ischemic Stroke								
Died	55	57	60	50	55	48	41	44
Discharged to a Continuing Care Facility	53	34	35	45	46	52	39	28
Hospitalized Hemorrhagic Stroke								
Died	15	10	10	14	12	12	9	8
Discharged to a Continuing Care Facility	[redacted]	5	[redacted]					
Total Hospitalized Ischemic Stroke								
Died	**383**	**364**	**368**	**324**	**341**	**380**	**338**	**307**
Discharged to a Continuing Care Facility	**258**	**240**	**232**	**246**	**246**	**237**	**230**	**194**
Death and Disability	**641**	**604**	**600**	**570**	**587**	**617**	**568**	**501**
Total Hospitalized Hemorrhagic Stroke								
Died	**120**	**111**	**102**	**98**	**102**	**97**	**114**	**112**
Discharged to a Continuing Care Facility	**32**	**31**	**24**	**28**	**45**	**40**	**38**	**29**
Death and Disability	**152**	**142**	**126**	**126**	**147**	**137**	**152**	**141**
Total Number of Stroke Hospitalizations								
Died	**503**	**475**	**470**	**422**	**443**	**477**	**452**	**419**
Discharged to a Continuing Care Facility	**290**	**271**	**256**	**274**	**291**	**277**	**268**	**223**
Death and Disability	**793**	**746**	**726**	**696**	**734**	**754**	**720**	**642**
Discharge Disposition - Proportion								
Incident Stroke Patients								
Hospitalized Ischemic Stroke								
Died	26.5%	24.6%	26.1%	22.7%	23.5%	26.0%	23.5%	21.8%
Discharged to a Continuing Care Facility	16.3%	16.6%	16.6%	16.3%	16.3%	14.6%	15.0%	13.7%
Hospitalized Hemorrhagic Stroke								
Died	37.8%	39.5%	37.1%	33.5%	32.0%	30.9%	35.2%	34.9%
Discharged to a Continuing Care Facility	10.8%	10.2%	8.1%	10.0%	14.0%	12.7%	11.7%	8.6%
Readmission								
Hospitalized Ischemic Stroke								
Died	18.8%	14.3%	13.6%	8.3%	23.5%	36.1%	14.8%	18.8%
Discharged to a Continuing Care Facility	21.9%	7.1%	13.6%	16.7%	23.5%	13.9%	14.8%	15.6%
Hospitalized Hemorrhagic Stroke								
Died	0.0%	0.0%	0.0%	0.0%	16.7%	0.0%	0.0%	33.3%
Discharged to a Continuing Care Facility	0.0%	0.0%	0.0%	0.0%	33.3%	50.0%	0.0%	16.7%
Recurrence								
Hospitalized Ischemic Stroke								
Died	25.8%	28.4%	28.3%	25.0%	26.4%	21.7%	20.8%	22.7%
Discharged to a Continuing Care Facility	24.9%	16.9%	16.5%	22.5%	22.1%	23.5%	19.8%	14.4%
Hospitalized Hemorrhagic Stroke								
Died	62.5%	40.0%	38.5%	50.0%	44.4%	48.0%	34.6%	42.1%
Discharged to a Continuing Care Facility	8.3%	20.0%	15.4%	10.7%	14.8%	16.0%	11.5%	15.8%
Total Hospitalized Ischemic Stroke								
Died	**26.2%**	**24.9%**	**26.3%**	**22.6%**	**23.9%**	**25.6%**	**23.0%**	**21.9%**
Discharged to a Continuing Care Facility	**17.6%**	**16.4%**	**16.6%**	**17.2%**	**17.3%**	**15.9%**	**15.6%**	**13.8%**
Death and Disability	**43.8%**	**41.4%**	**42.8%**	**39.8%**	**41.2%**	**41.5%**	**38.6%**	**35.7%**
Total Hospitalized Hemorrhagic Stroke								
Died	**39.1%**	**39.2%**	**37.0%**	**34.8%**	**32.8%**	**32.1%**	**34.7%**	**35.3%**
Discharged to a Continuing Care Facility	**10.4%**	**11.0%**	**8.7%**	**9.9%**	**14.5%**	**13.2%**	**11.6%**	**9.1%**
Death and Disability	**49.5%**	**50.2%**	**45.7%**	**44.7%**	**47.3%**	**45.4%**	**46.2%**	**44.5%**
Total Number of Stroke Hospitalizations								
Died	**28.4%**	**27.3%**	**28.0%**	**24.6%**	**25.5%**	**26.7%**	**25.1%**	**24.4%**
Discharged to a Continuing Care Facility	**16.4%**	**15.6%**	**15.3%**	**16.0%**	**16.8%**	**15.5%**	**14.9%**	**13.0%**
Death and Disability	**44.8%**	**42.8%**	**43.3%**	**40.6%**	**42.3%**	**42.2%**	**40.0%**	**37.3%**

* Age 20 and older

Recurrent stroke admissions *are defined as any hospitalization for stroke following an incident hospitalized stroke, with the exception of admissions within 28 days for the same stroke type (ischemic or hemorrhagic), which are considered* ***readmissions****.*

FRASER EAST HSDA

Indicators and Metrics

FRASER EAST HSDA
INDICATORS AND METRICS AS OF NOVEMBER 2010

Acute Cerebrovascular Syndrome
Adults* Residing in the Fraser East HSDA
2001/02 to 2008/09

	Fiscal Year								% Change
	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	01/02 to 08/09
Number of Incident ACVS Patients									
Hospitalized Ischemic Stroke	250	259	225	244	238	261	269	252	0.8%
Hospitalized Hemorrhagic Stroke	51	43	42	51	54	55	53	44	-13.7%
Sub-total	**301**	**302**	**267**	**295**	**292**	**316**	**322**	**296**	**-1.7%**
Hospitalized TIA	64	81	78	78	81	72	76	78	21.9%
Non-hospitalized TIA/Stroke	146	188	214	216	236	241	276	249	70.5%
Sub-total	**210**	**269**	**292**	**294**	**317**	**313**	**352**	**327**	**55.7%**
Number of Prevalent ACVS Patients									
Hospitalized Ischemic Stroke	1,414	1,495	1,526	1,553	1,573	1,608	1,659	1,703	20.4%
Hospitalized Hemorrhagic Stroke	247	261	273	295	321	345	356	373	51.0%
Sub-total	**1,661**	**1,756**	**1,799**	**1,848**	**1,894**	**1,953**	**2,015**	**2,076**	**25.0%**
Hospitalized TIA	491	526	558	586	614	629	651	657	33.8%
Non-hospitalized TIA/Stroke	1,141	1,209	1,313	1,427	1,547	1,664	1,782	1,874	64.2%
Sub-total	**1,632**	**1,735**	**1,871**	**2,013**	**2,161**	**2,293**	**2,433**	**2,531**	**55.1%**
Age-Standardized Incidence / 1,000 Population									
Hospitalized Ischemic Stroke	1.037	1.038	0.870	0.925	0.867	0.919	0.927	0.822	-20.8%
Hospitalized Hemorrhagic Stroke	0.218	0.175	0.166	0.200	0.203	0.201	0.200	0.147	-32.5%
Sub-total	**1.262**	**1.220**	**1.043**	**1.131**	**1.077**	**1.128**	**1.133**	**0.976**	**-22.7%**
Hospitalized TIA	0.263	0.321	0.298	0.285	0.296	0.253	0.258	0.257	-2.0%
Non-hospitalized TIA/Stroke	0.610	0.767	0.851	0.830	0.887	0.879	0.978	0.878	44.0%
Age-Standardized Prevalence / 1,000 Population									
Hospitalized Ischemic Stroke	5.499	5.642	5.572	5.495	5.400	5.375	5.390	5.346	-2.8%
Hospitalized Hemorrhagic Stroke	1.028	1.061	1.080	1.135	1.201	1.257	1.276	1.297	26.2%
Sub-total	**6.527**	**6.702**	**6.652**	**6.630**	**6.601**	**6.632**	**6.666**	**6.643**	**1.8%**
Hospitalized TIA	1.916	1.990	2.047	2.072	2.115	2.106	2.106	2.066	7.9%
Non-hospitalized TIA/Stroke	4.671	4.820	5.116	5.387	5.668	5.908	6.131	6.289	34.6%
Conversion Rate from TIA/Non-hospitalized Stroke to Hospitalized Stroke									
90-Day Conversion Rate	2.50%	3.83%			2.91%	2.61%	2.33%		
365-Day Conversion Rate	4.00%	5.36%	3.21%	3.51%	3.56%	4.56%	3.50%		
Utilization of tPA by Incident Acute Ischemic Stroke Patients									
Number Receiving tPA						2	3	4	
Total Number						261	269	252	
Proportion of Incident Hospitalized AIS Patients Receiving tPA						0.77%	1.12%	1.59%	
Utilization of Acute Care by Incident Ischemic Stroke Patients									
Discharges	250	259	225	244	238	261	269	252	0.8%
ALOS	23.65	26.41	19.39	19.38	23.22	18.85	20.23	17.57	-25.7%
Patient Days	5,913	6,840	4,363	4,728	5,527	4,919	5,441	4,428	-25.1%
Utilization of Acute Care by Incident Hemorrhagic Stroke Patients									
Discharges	51	43	42	51	54	55	53	44	-13.7%
ALOS	37.04	28.23	31.60	30.43	35.15	30.51	36.17	24.95	-32.6%
Patient Days	1,889	1,214	1,327	1,552	1,898	1,678	1,917	1,098	-41.9%
Discharge Disposition following Acute Admissions for Incident Ischemic Stroke Patients									
Died	20.4%	22.0%	30.2%	27.9%	22.7%	27.2%	24.2%	25.0%	22.5%
Discharged to Home	48.0%	49.8%	42.2%	49.6%	42.0%	44.4%	47.6%	48.0%	0.0%
Home with Support Services	12.4%	10.0%	8.9%	7.8%	10.9%	13.0%	10.4%	9.1%	-26.4%
Continuing Care Facility	18.4%	17.0%	17.3%	14.3%	20.2%	13.4%	14.9%	11.5%	-37.5%
Other	0.8%	1.2%	1.3%	0.4%	4.2%	1.9%	3.0%	6.3%	693.7%
Discharge Disposition following Acute Admissions for Incident Hemorrhagic Stroke Patients									
Died	29.4%	39.5%	28.6%	31.4%	44.4%	45.5%	34.0%	36.4%	23.6%
Discharged to Home	43.1%	34.9%	42.9%	52.9%	37.0%	34.5%	45.3%	45.5%	5.4%
Home with Support Services	3.9%	9.3%	14.3%	5.9%		5.5%	5.7%	2.3%	-42.0%
Continuing Care Facility	13.7%	14.0%	11.9%	5.9%	18.5%	12.7%	9.4%	9.1%	-33.8%
Other	9.8%	2.3%	2.4%	3.9%		1.8%	5.7%	6.8%	-30.5%
Mortality Following an Incident Stroke									
Hospitalized Ischemic Stroke									
Crude 30-day In-hospital Mortality Rate	16.0%	17.8%	25.8%	23.8%	16.8%	23.4%	19.7%	22.6%	41.4%
Crude 31-365 Day Mortality Rate in 30-day In-hospital Survivors	18.1%	21.1%	16.8%	21.0%	25.8%	22.0%	22.2%	20.0%	10.5%
Hospitalized Hemorrhagic Stroke									
Crude 30-day In-hospital Mortality Rate	23.5%	39.5%	28.6%	27.5%	40.7%	38.2%	30.2%	34.1%	44.9%
Crude 31-365 Day Mortality Rate in 30-day In-hospital Survivors	15.4%	3.8%	6.7%	5.4%	15.6%	26.5%	18.9%	6.9%	-55.2%

Grey Shading = Not Applicable/Available

Underlined % are based on a numerator of less than 5

* Age 20 and older

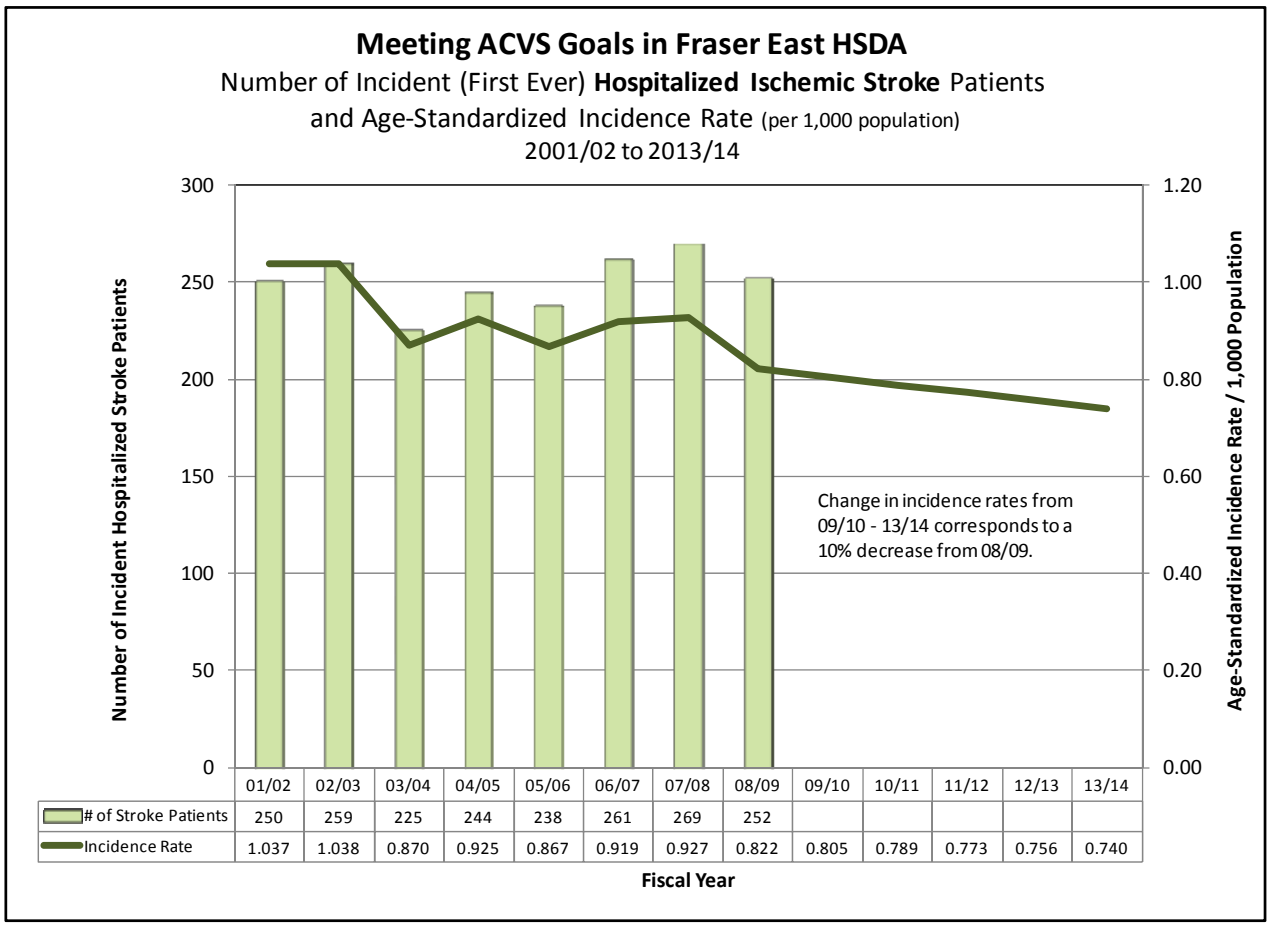
FRASER EAST HSDA
INDICATORS AND METRICS

The BC Stroke Strategy Measurement and Evaluation Working Group have suggested five key indicators for tracking progress on ACVS care in the province. The following charts and tables include trend data for **Fraser East HSDA** for three of these five indicators. The source of this data is from the updated Acute Cerebrovascular Syndrome (ACVS) Registry. Note that the geographic location is based on the patient's residence, not necessarily the location of their treatment.

Indicator #3 – Incidence Rate

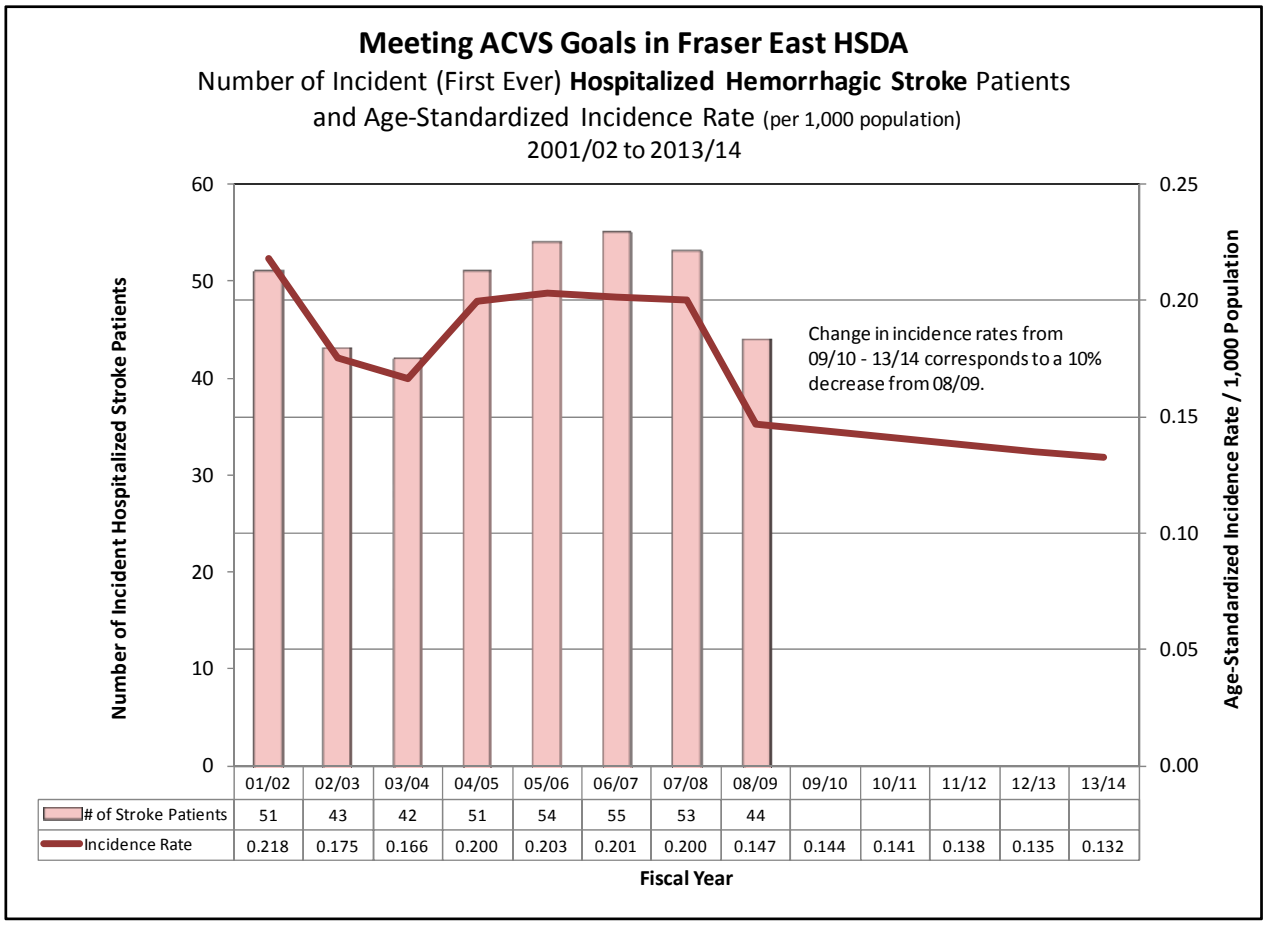
Reduce the age-standardized incidence rate of both ischemic and hemorrhagic stroke by **10%** between 2008/09 and 2013/14 (*data source:* updated ACVS Registry).

Fraser East HSDA – Incident Hospitalized Ischemic Stroke Patients



Indicator #3 - Incidence Rate (continued)

Fraser East HSDA – Incident Hospitalized Hemorrhagic Stroke Patients



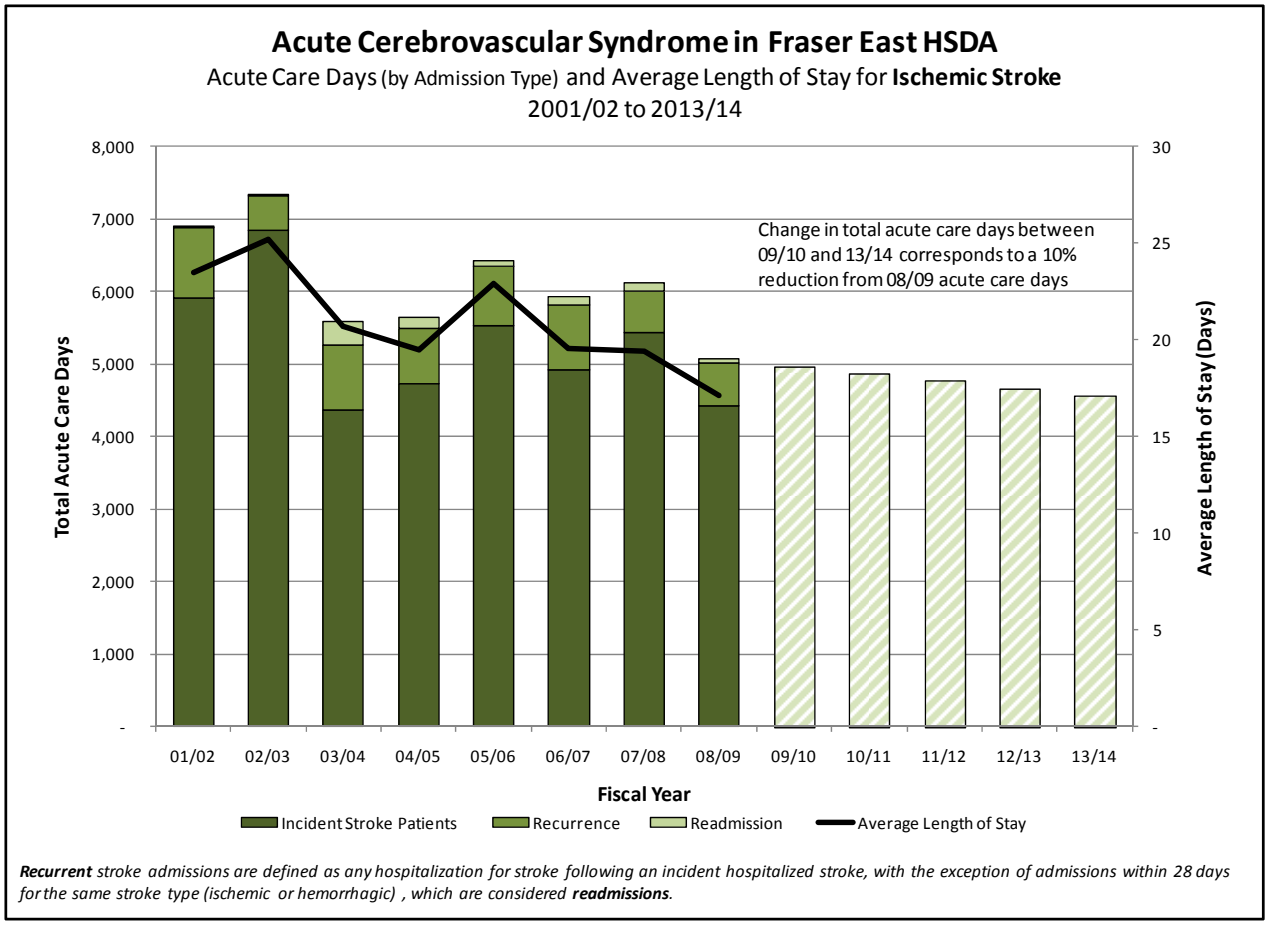
	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11	11/12	12/13	13/14
# of Stroke Patients	51	43	42	51	54	55	53	44					
Incidence Rate	0.218	0.175	0.166	0.200	0.203	0.201	0.200	0.147	0.144	0.141	0.138	0.135	0.132

Indicator #4 – Acute Care Days

Reduce acute care days for discharges in which an ischemic stroke is the principal diagnosis by **10%** between 2008/09 and 2013/14 (this includes a combination of reduced discharges and reduced average length of stay).

> *Data Source:* Updated ACVS Registry for incident, re-admit and recurrent ischemic stroke discharges. Link to the Discharge Abstract Database (DAD) for number of hospital days associated with these discharges. **Recurrent** stroke admissions are defined as any hospitalization for stroke following an incident hospitalized stroke, with the exception of admissions within 28 days for the same stroke type (ischemic or hemorrhagic), which are considered **readmissions**.

Fraser East HSDA – Acute Care Days and ALOS for Ischemic Stroke Patients



***Recurrent** stroke admissions are defined as any hospitalization for stroke following an incident hospitalized stroke, with the exception of admissions within 28 days for the same stroke type (ischemic or hemorrhagic) , which are considered **readmissions**.*

Indicator #4 – Acute Care Days (continued)

Fraser East HSDA – Hospitalization and ALOS Data Trends

Hospitalization and ALOS for Stroke
Adults* Residing in Fraser East HSDA
2001/02 to 2008/09

	Fiscal Year							
	2001/02	**2002/03**	**2003/04**	**2004/05**	**2005/06**	**2006/07**	**2007/08**	**2008/09**
Number of Stroke Hospitalizations								
Number of Incident Stroke Patients								
Hospitalized Ischemic Stroke	250	259	225	244	238	261	269	252
Hospitalized Hemorrhagic Stroke	51	43	42	51	54	55	53	44
Readmission								
Hospitalized Ischemic Stroke	[redacted]		6	12	[redacted]	8	5	6
Hospitalized Hemorrhagic Stroke	[redacted]	-	-	[redacted]	-	-	[redacted]	
Recurrence								
Hospitalized Ischemic Stroke	41	30	39	34	40	35	41	38
Hospitalized Hemorrhagic Stroke	7	[redacted]	5	[redacted]				
Total Hospitalized Ischemic Stroke	**294**	**291**	**270**	**290**	**280**	**304**	**315**	**296**
Total Hospitalized Hemorrhagic Stroke	**60**	**45**	**47**	**55**	**56**	**59**	**56**	**47**
Total Number of Stroke Hospitalizations	**354**	**336**	**317**	**345**	**336**	**363**	**371**	**343**
Average Length of Stay in Acute Care								
Incident Stroke Patients								
Hospitalized Ischemic Stroke	23.65	26.41	19.39	19.38	23.22	18.85	20.23	17.57
Hospitalized Hemorrhagic Stroke	37.04	28.23	31.60	30.43	35.15	30.51	36.17	24.95
Readmission								
Hospitalized Ischemic Stroke	5.00	3.50	55.33	12.42	34.50	15.25	23.80	10.67
Hospitalized Hemorrhagic Stroke	12.00			114.00			1.50	4.00
Recurrence								
Hospitalized Ischemic Stroke	23.68	15.93	23.03	22.44	20.55	25.49	13.59	15.26
Hospitalized Hemorrhagic Stroke	44.29	11.50	35.80	7.33	59.00	10.00	15.00	4.50
Total Hospitalized Ischemic Stroke	**23.47**	**25.17**	**20.71**	**19.45**	**22.92**	**19.52**	**19.42**	**17.14**
Total Hospitalized Hemorrhagic Stroke	**37.05**	**27.49**	**32.04**	**30.69**	**36.00**	**29.12**	**34.55**	**23.64**
Total Number of Stroke Hospitalizations	**25.77**	**25.48**	**22.39**	**21.24**	**25.10**	**21.08**	**21.70**	**18.03**
Days in Acute Care								
Number of Incident Stroke Patients								
Hospitalized Ischemic Stroke	5,913	6,840	4,363	4,728	5,527	4,919	5,441	4,428
Hospitalized Hemorrhagic Stroke	1,889	1,214	1,327	1,552	1,898	1,678	1,917	1,098
Readmission								
Hospitalized Ischemic Stroke	15	7	332	149	69	122	119	64
Hospitalized Hemorrhagic Stroke	24	-	-	114	-	-	[redacted]	
Recurrence								
Hospitalized Ischemic Stroke	971	478	898	763	822	892	557	580
Hospitalized Hemorrhagic Stroke	310	23	179	22	118	40	15	9
Total Days - Hospitalized Ischemic Stroke	**6,899**	**7,325**	**5,593**	**5,640**	**6,418**	**5,933**	**6,117**	**5,072**
Total Days - Hospitalized Hemorrhagic Stroke	**2,223**	**1,237**	**1,506**	**1,688**	**2,016**	**1,718**	**1,935**	**1,111**
Total Days	**9,122**	**8,562**	**7,099**	**7,328**	**8,434**	**7,651**	**8,052**	**6,183**

* Age 20 and older

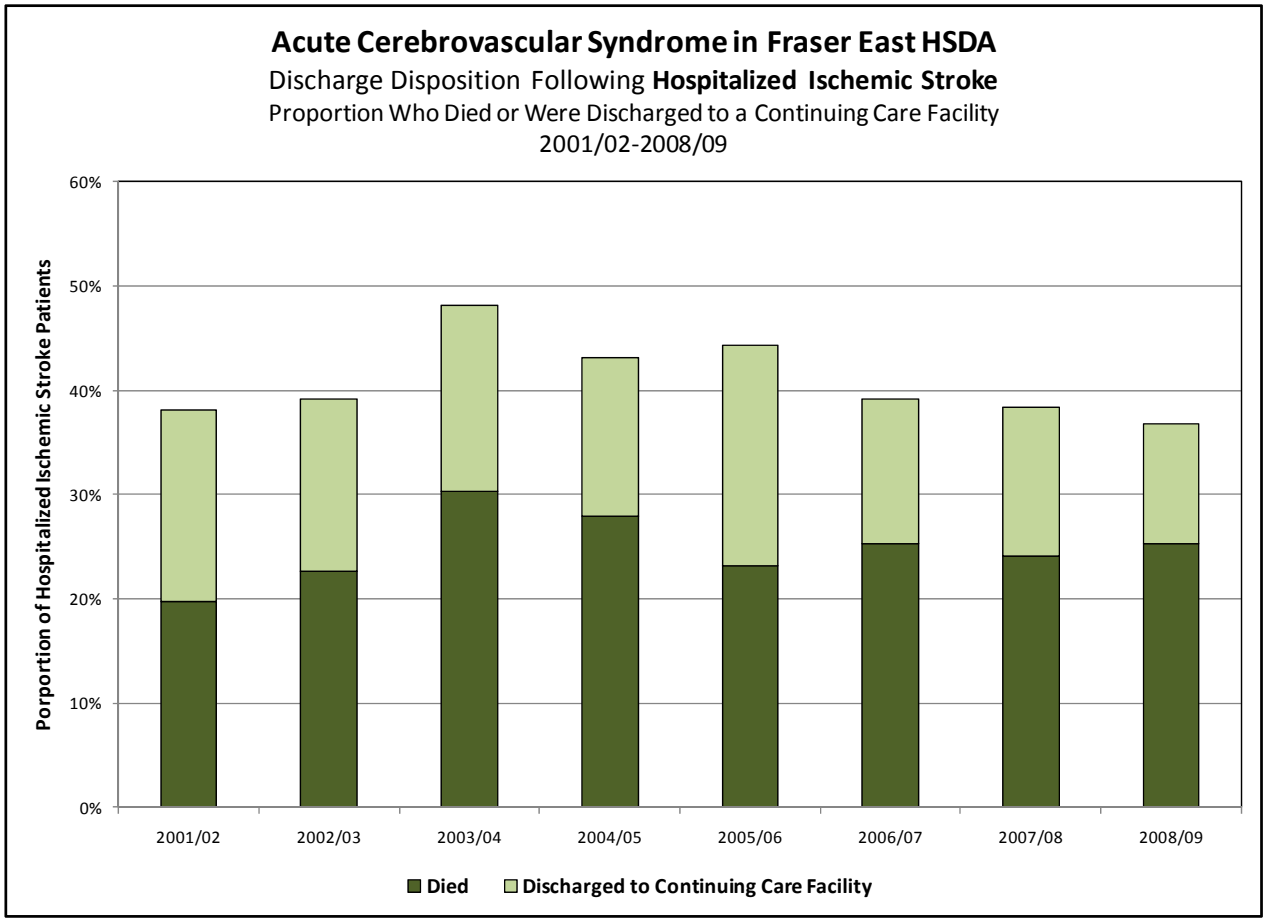
Recurrent stroke admissions *are defined as any hospitalization for stroke following an incident hospitalized stroke, with the exception of admissions within 28 days for the same stroke type (ischemic or hemorrhagic), which are considered* ***readmissions****.*

Indicator #5 – Death and Dependency

Reduce the proportion of patients who die in hospital or are sent to a long- term care facility after being admitted/discharged (principal diagnosis) for ischemic stroke. *If only one composite measure is used to assess progress in stroke care, it would be this overall measure of death and dependency.*

> *Data Source:* Updated ACVS Registry for hospitalized (incident, readmission and recurrent) ischemic stroke discharges. Discharge Abstract Database (DAD) for discharge disposition ('died', 'discharged to a Continuing Care facility').

Fraser East HSDA – Discharge Disposition for Hospitalized Ischemic Stroke



Indicator #5 – Death and Dependency (continued)

Fraser East HSDA – Discharge Disposition Data Trends

Discharge Disposition Following a Hospitalization for Stroke

Patient Died or Was Discharged to a Continuing Care Facility

Adults* Residing in Fraser East HSDA

2001/02 to 2008/09

	Fiscal Year							
	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09
Number of Stroke Hospitalizations								
Number of Incident Stroke Patients								
Hospitalized Ischemic Stroke	250	259	225	244	238	261	269	252
Hospitalized Hemorrhagic Stroke	51	43	42	51	54	55	53	44
Readmission								
Hospitalized Ischemic Stroke	[redacted]		6	12	[redacted]	8	5	6
Hospitalized Hemorrhagic Stroke	[redacted]	-	-	[redacted]	-	-	[redacted]	
Recurrence								
Hospitalized Ischemic Stroke	41	30	39	34	40	35	41	38
Hospitalized Hemorrhagic Stroke	7	[redacted]	5	[redacted]				
Total Hospitalized Ischemic Stroke	**294**	**291**	**270**	**290**	**280**	**304**	**315**	**296**
Total Hospitalized Hemorrhagic Stroke	**60**	**45**	**47**	**55**	**56**	**59**	**56**	**47**
Total Number of Stroke Hospitalizations	**354**	**336**	**317**	**345**	**336**	**363**	**371**	**343**
Discharge Disposition - Number								
Incident Stroke Patients								
Hospitalized Ischemic Stroke								
Died	51	57	68	68	54	71	65	63
Discharged to a Continuing Care Facility	46	44	39	35	48	35	40	29
Hospitalized Hemorrhagic Stroke								
Died	15	17	12	16	24	25	18	16
Discharged to a Continuing Care Facility	7	6	5	[redacted]	10	7	5	[redacted]
Readmission								
Hospitalized Ischemic Stroke								
Died	[redacted]			-	-	[redacted]		
Discharged to a Continuing Care Facility	[redacted]	-	[redacted]			[redacted]	-	[redacted]
Hospitalized Hemorrhagic Stroke								
Died	-	-	-	-	-	-	-	[redacted]
Discharged to a Continuing Care Facility	-	-	-	-	-	-	-	-
Recurrence								
Hospitalized Ischemic Stroke								
Died	6	8	13	13	11	5	10	9
Discharged to a Continuing Care Facility	7	[redacted]	8	6	10	6	5	[redacted]
Hospitalized Hemorrhagic Stroke								
Died	[redacted]			[redacted]	-	-	-	[redacted]
Discharged to a Continuing Care Facility	[redacted]	-	-	-	[redacted]		-	-
Total Hospitalized Ischemic Stroke								
Died	**58**	**66**	**82**	**81**	**65**	**77**	**76**	**75**
Discharged to a Continuing Care Facility	**54**	**48**	**48**	**44**	**59**	**42**	**45**	**34**
Death and Disability	**112**	**114**	**130**	**125**	**124**	**119**	**121**	**109**
Total Hospitalized Hemorrhagic Stroke								
Died	**17**	**19**	**15**	**17**	**24**	**25**	**18**	**18**
Discharged to a Continuing Care Facility	**9**	**6**	**5**	[redacted]	**11**	**8**	**5**	[redacted]
Death and Disability	**26**	**25**	**20**	**20**	**35**	**33**	**23**	**22**
Total Number of Stroke Hospitalizations								
Died	**75**	**85**	**97**	**98**	**89**	**102**	**94**	**93**
Discharged to a Continuing Care Facility	**63**	**54**	**53**	**47**	**70**	**50**	**50**	**38**
Death and Disability	**138**	**139**	**150**	**145**	**159**	**152**	**144**	**131**
Discharge Disposition - Proportion								
Incident Stroke Patients								
Hospitalized Ischemic Stroke								
Died	20.4%	22.0%	30.2%	27.9%	22.7%	27.2%	24.2%	25.0%
Discharged to a Continuing Care Facility	18.4%	17.0%	17.3%	14.3%	20.2%	13.4%	14.9%	11.5%
Hospitalized Hemorrhagic Stroke								
Died	29.4%	39.5%	28.6%	31.4%	44.4%	45.5%	34.0%	36.4%
Discharged to a Continuing Care Facility	13.7%	14.0%	11.9%	5.9%	18.5%	12.7%	9.4%	9.1%
Readmission								
Hospitalized Ischemic Stroke								
Died	33.3%	50.0%	16.7%	0.0%	0.0%	12.5%	20.0%	50.0%
Discharged to a Continuing Care Facility	33.3%	0.0%	16.7%	25.0%	50.0%	12.5%	0.0%	33.3%
Hospitalized Hemorrhagic Stroke								
Died	0.0%			0.0%			0.0%	100.0%
Discharged to a Continuing Care Facility	0.0%			0.0%			0.0%	0.0%
Recurrence								
Hospitalized Ischemic Stroke								
Died	14.6%	26.7%	33.3%	38.2%	27.5%	14.3%	24.4%	23.7%
Discharged to a Continuing Care Facility	17.1%	13.3%	20.5%	17.6%	25.0%	17.1%	12.2%	7.9%
Hospitalized Hemorrhagic Stroke								
Died	28.6%	100.0%	60.0%	33.3%	0.0%	0.0%	0.0%	50.0%
Discharged to a Continuing Care Facility	28.6%	0.0%	0.0%	0.0%	50.0%	25.0%	0.0%	0.0%
Total Hospitalized Ischemic Stroke								
Died	**19.7%**	**22.7%**	**30.4%**	**27.9%**	**23.2%**	**25.3%**	**24.1%**	**25.3%**
Discharged to a Continuing Care Facility	**18.4%**	**16.5%**	**17.8%**	**15.2%**	**21.1%**	**13.8%**	**14.3%**	**11.5%**
Death and Disability	**38.1%**	**39.2%**	**48.1%**	**43.1%**	**44.3%**	**39.1%**	**38.4%**	**36.8%**
Total Hospitalized Hemorrhagic Stroke								
Died	**28.3%**	**42.2%**	**31.9%**	**30.9%**	**42.9%**	**42.4%**	**32.1%**	**38.3%**
Discharged to a Continuing Care Facility	**15.0%**	**13.3%**	**10.6%**	**5.5%**	**19.6%**	**13.6%**	**8.9%**	**8.5%**
Death and Disability	**43.3%**	**55.6%**	**42.6%**	**36.4%**	**62.5%**	**55.9%**	**41.1%**	**46.8%**
Total Number of Stroke Hospitalizations								
Died	**21.2%**	**25.3%**	**30.6%**	**28.4%**	**26.5%**	**28.1%**	**25.3%**	**27.1%**
Discharged to a Continuing Care Facility	**17.8%**	**16.1%**	**16.7%**	**13.6%**	**20.8%**	**13.8%**	**13.5%**	**11.1%**
Death and Disability	**39.0%**	**41.4%**	**47.3%**	**42.0%**	**47.3%**	**41.9%**	**38.8%**	**38.2%**

* Age 20 and older

Recurrent stroke admissions *are defined as any hospitalization for stroke following an incident hospitalized stroke, with the exception of admissions within 28 days for the same stroke type (ischemic or hemorrhagic), which are considered* ***readmissions****.*

FRASER NORTH HSDA

Indicators and Metrics

FRASER NORTH HSDA
INDICATORS AND METRICS AS OF NOVEMBER 2010

Acute Cerebrovascular Syndrome
Adults* Residing in the Fraser North HSDA
2001/02 to 2008/09

	Fiscal Year								% Change
	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	01/02 to 08/09
Number of Incident ACVS Patients									
Hospitalized Ischemic Stroke	395	458	426	435	417	444	423	388	-1.8%
Hospitalized Hemorrhagic Stroke	103	111	97	86	93	104	118	130	26.2%
Sub-total	**498**	**569**	**523**	**521**	**510**	**548**	**541**	**518**	**4.0%**
Hospitalized TIA	112	112	100	109	121	104	130	139	24.1%
Non-hospitalized TIA/Stroke	375	425	397	427	489	445	502	492	31.2%
Sub-total	**487**	**537**	**497**	**536**	**610**	**549**	**632**	**631**	**29.6%**
Number of Prevalent ACVS Patients									
Hospitalized Ischemic Stroke	2,366	2,479	2,562	2,632	2,712	2,785	2,807	2,827	19.5%
Hospitalized Hemorrhagic Stroke	532	571	599	617	645	706	760	825	55.1%
Sub-total	**2,898**	**3,050**	**3,161**	**3,249**	**3,357**	**3,491**	**3,567**	**3,652**	**26.0%**
Hospitalized TIA	725	761	794	828	862	877	918	967	33.4%
Non-hospitalized TIA/Stroke	2,363	2,574	2,733	2,900	3,086	3,261	3,499	3,697	56.5%
Sub-total	**3,088**	**3,335**	**3,527**	**3,728**	**3,948**	**4,138**	**4,417**	**4,664**	**51.0%**
Age-Standardized Incidence / 1,000 Population									
Hospitalized Ischemic Stroke	0.918	1.025	0.927	0.915	0.852	0.878	0.797	0.706	-23.1%
Hospitalized Hemorrhagic Stroke	0.227	0.241	0.200	0.171	0.181	0.190	0.215	0.225	-0.6%
Sub-total	**1.153**	**1.275**	**1.136**	**1.093**	**1.040**	**1.076**	**1.019**	**0.940**	**-18.5%**
Hospitalized TIA	0.256	0.248	0.211	0.225	0.240	0.198	0.238	0.252	-1.7%
Non-hospitalized TIA/Stroke	0.866	0.953	0.856	0.901	0.993	0.880	0.951	0.901	4.0%
Age-Standardized Prevalence / 1,000 Population									
Hospitalized Ischemic Stroke	5.167	5.228	5.219	5.210	5.205	5.161	5.012	4.851	-6.1%
Hospitalized Hemorrhagic Stroke	1.143	1.194	1.205	1.201	1.220	1.285	1.337	1.394	22.0%
Sub-total	**6.310**	**6.422**	**6.423**	**6.411**	**6.426**	**6.446**	**6.350**	**6.245**	**-1.0%**
Hospitalized TIA	1.587	1.610	1.618	1.633	1.642	1.602	1.612	1.638	3.2%
Non-hospitalized TIA/Stroke	5.342	5.640	5.777	5.971	6.138	6.253	6.487	6.564	22.9%
Conversion Rate from TIA/Non-hospitalized Stroke to Hospitalized Stroke									
90-Day Conversion Rate	3.99%	2.31%	2.67%	3.27%	1.68%	2.60%	1.48%		
365-Day Conversion Rate	5.67%	4.05%	3.70%	5.00%	3.37%	4.28%	3.28%		
Utilization of tPA by Incident Acute Ischemic Stroke Patients									
Number Receiving tPA						9	14	11	
Total Number						444	423	388	
Proportion of Incident Hospitalized AIS Patients Receiving tPA						2.03%	3.31%	2.84%	
Utilization of Acute Care by Incident Ischemic Stroke Patients									
Discharges	395	458	426	435	417	444	423	388	-1.8%
ALOS	33.46	34.45	32.58	34.59	32.07	35.89	31.77	28.83	-13.8%
Patient Days	13,215	15,776	13,879	15,048	13,372	15,934	13,438	11,185	-15.4%
Utilization of Acute Care by Incident Hemorrhagic Stroke Patients									
Discharges	103	111	97	86	93	104	118	130	26.2%
ALOS	41.86	39.49	29.61	34.77	37.60	45.64	51.73	29.82	-28.8%
Patient Days	4,312	4,383	2,872	2,990	3,497	4,747	6,104	3,876	-10.1%
Discharge Disposition following Acute Admissions for Incident Ischemic Stroke Patients									
Died	24.8%	23.1%	25.8%	18.2%	24.2%	23.9%	24.1%	17.0%	-31.4%
Discharged to Home	42.3%	43.7%	40.8%	44.6%	38.1%	44.8%	44.2%	46.1%	9.1%
Home with Support Services	12.4%	12.2%	13.4%	15.2%	17.5%	11.0%	12.3%	10.6%	-14.8%
Continuing Care Facility	17.5%	17.7%	16.7%	19.3%	15.3%	15.5%	14.4%	16.0%	-8.5%
Other	3.0%	3.3%	3.3%	2.8%	4.8%	4.7%	5.0%	10.3%	239.3%
Discharge Disposition following Acute Admissions for Incident Hemorrhagic Stroke Patients									
Died	39.8%	44.1%	34.0%	30.2%	20.4%	28.8%	29.7%	33.8%	-15.0%
Discharged to Home	37.9%	33.3%	42.3%	47.7%	44.1%	40.4%	45.8%	43.8%	15.8%
Home with Support Services	6.8%	8.1%	8.2%	4.7%	10.8%	13.5%	6.8%	3.8%	-43.4%
Continuing Care Facility	12.6%	11.7%	9.3%	10.5%	18.3%	13.5%	14.4%	11.5%	-8.6%
Other	2.9%	2.7%	6.2%	7.0%	6.5%	3.8%	3.4%	6.9%	137.7%
Mortality Following an Incident Stroke									
Hospitalized Ischemic Stroke									
Crude 30-day In-hospital Mortality Rate	20.0%	16.4%	19.0%	15.4%	18.0%	19.4%	19.1%	12.9%	-35.6%
Crude 31-365 Day Mortality Rate in 30-day In-hospital Survivors	18.7%	19.8%	19.4%	19.6%	23.1%	19.0%	20.5%	20.7%	10.9%
Hospitalized Hemorrhagic Stroke									
Crude 30-day In-hospital Mortality Rate	33.0%	42.3%	29.9%	27.9%	18.3%	25.0%	27.1%	27.7%	-16.1%
Crude 31-365 Day Mortality Rate in 30-day In-hospital Survivors	18.8%	12.5%	19.1%	11.3%	11.8%	17.9%	15.1%	20.2%	7.3%

Grey Shading = Not Applicable/Available

Underlined % are based on a numerator of less than 5

* Age 20 and older

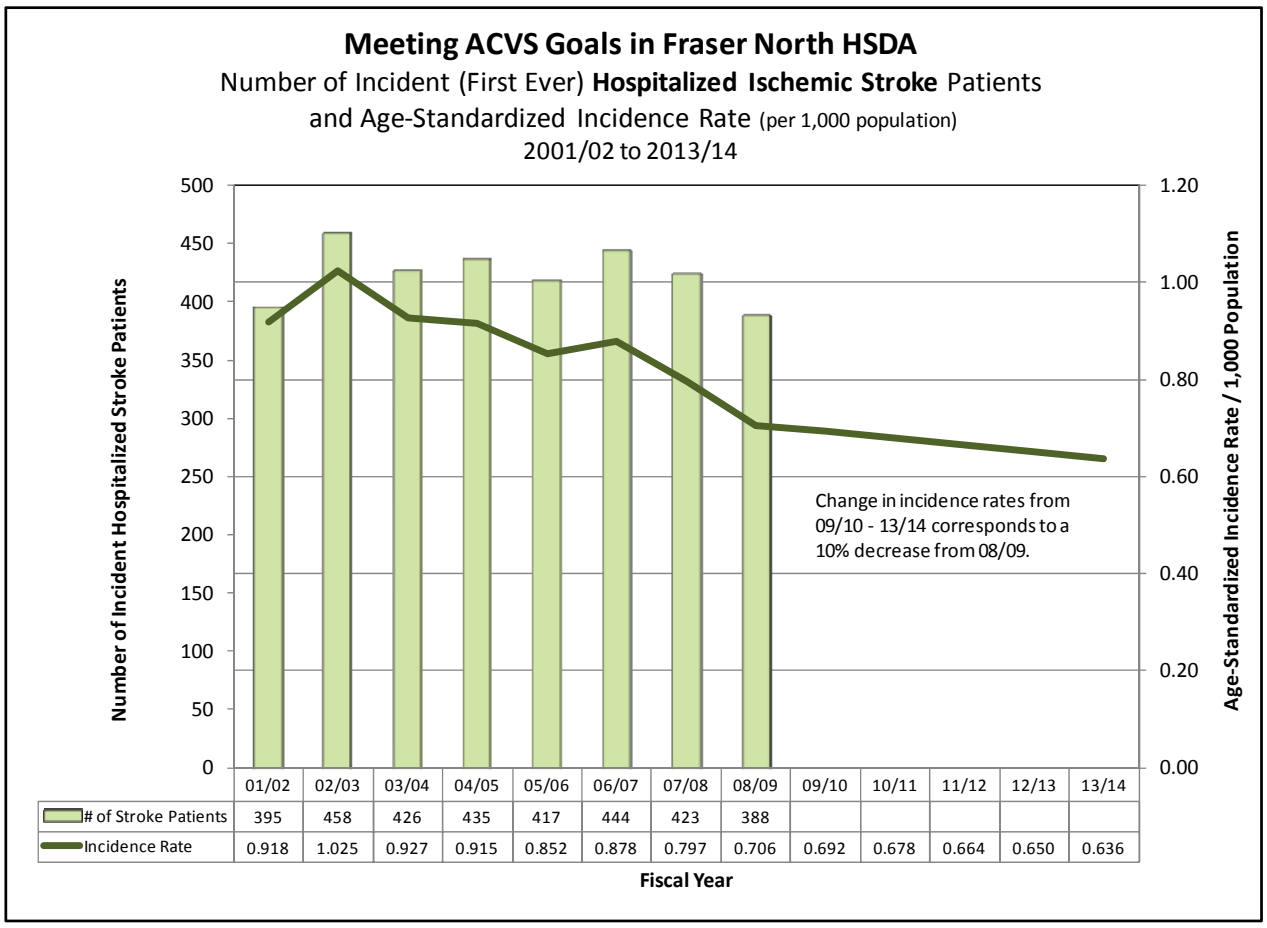
FRASER NORTH HSDA
INDICATORS AND METRICS

The BC Stroke Strategy Measurement and Evaluation Working Group have suggested five key indicators for tracking progress on ACVS care in the province. The following charts and tables include trend data for **Fraser North HSDA** for three of these five indicators. The source of this data is from the updated Acute Cerebrovascular Syndrome (ACVS) Registry. Note that the geographic location is based on the patient's residence, not necessarily the location of their treatment.

Indicator #3 – Incidence Rate

Reduce the age-standardized incidence rate of both ischemic and hemorrhagic stroke by **10%** between 2008/09 and 2013/14 (*data source:* updated ACVS Registry).

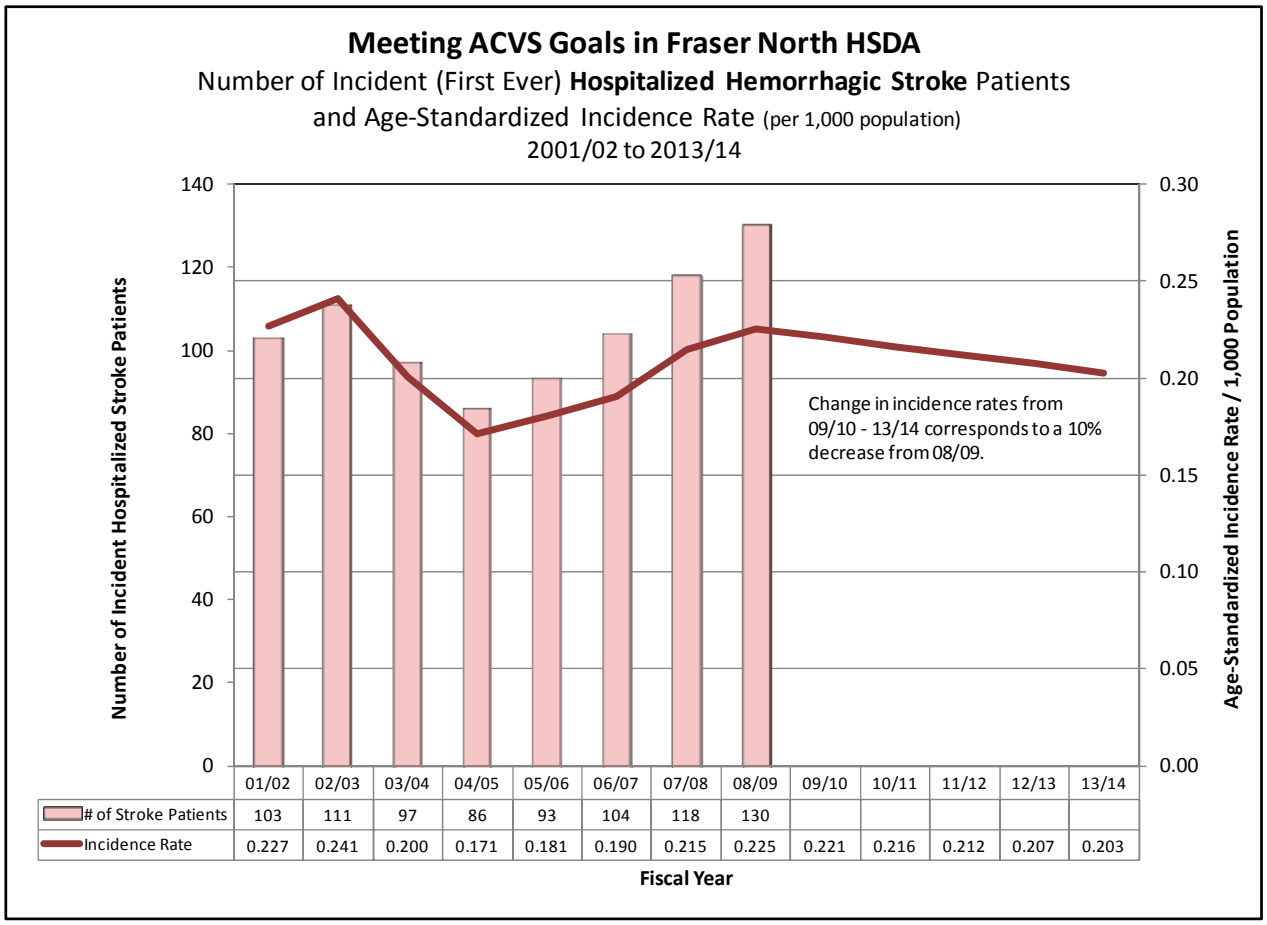
Fraser North HSDA – Incident Hospitalized Ischemic Stroke Patients



	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11	11/12	12/13	13/14
# of Stroke Patients	395	458	426	435	417	444	423	388					
Incidence Rate	0.918	1.025	0.927	0.915	0.852	0.878	0.797	0.706	0.692	0.678	0.664	0.650	0.636

Indicator #3 – Incidence Rate (continued)

Fraser North HSDA – Incident Hospitalized Hemorrhagic Stroke Patients



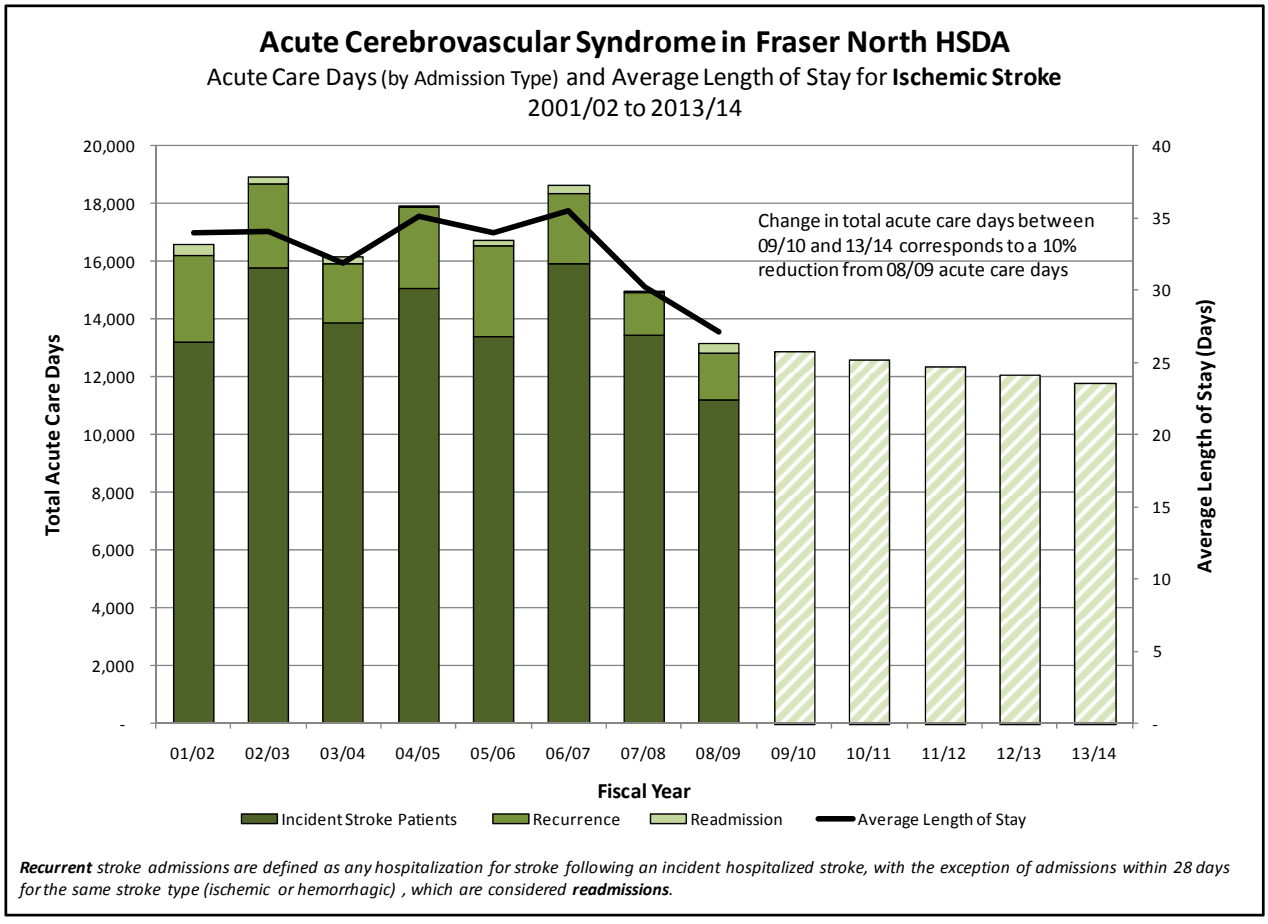
	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11	11/12	12/13	13/14
# of Stroke Patients	103	111	97	86	93	104	118	130					
Incidence Rate	0.227	0.241	0.200	0.171	0.181	0.190	0.215	0.225	0.221	0.216	0.212	0.207	0.203

Indicator #4 – Acute Care Days

Reduce acute care days for discharges in which an ischemic stroke is the principal diagnosis by **10%** between 2008/09 and 2013/14 (this includes a combination of reduced discharges and reduced average length of stay).

> *Data Source:* Updated ACVS Registry for incident, re-admit and recurrent ischemic stroke discharges. Link to the Discharge Abstract Database (DAD) for number of hospital days associated with these discharges. **Recurrent** stroke admissions are defined as any hospitalization for stroke following an incident hospitalized stroke, with the exception of admissions within 28 days for the same stroke type (ischemic or hemorrhagic), which are considered **readmissions**.

Fraser North HSDA – Acute Care Days and ALOS for Ischemic Stroke Patients



***Recurrent** stroke admissions are defined as any hospitalization for stroke following an incident hospitalized stroke, with the exception of admissions within 28 days for the same stroke type (ischemic or hemorrhagic) , which are considered **readmissions**.*

Indicator #4 – Acute Care Days (continued)

Fraser North HSDA – Hospitalization and ALOS Data Trends

Hospitalization and ALOS for Stroke
Adults* Residing in Fraser North HSDA
2001/02 to 2008/09

	Fiscal Year							
	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09
Number of Stroke Hospitalizations								
Number of Incident Stroke Patients								
Hospitalized Ischemic Stroke	395	458	426	435	417	444	423	388
Hospitalized Hemorrhagic Stroke	103	111	97	86	93	104	118	130
Readmission								
Hospitalized Ischemic Stroke	13	15	6	8		9	5	18
Hospitalized Hemorrhagic Stroke		-						
Recurrence								
Hospitalized Ischemic Stroke	80	82	76	67	71	71	66	79
Hospitalized Hemorrhagic Stroke	7	10	11	8	10	12	11	11
Total Hospitalized Ischemic Stroke	**488**	**555**	**508**	**510**	**491**	**524**	**494**	**485**
Total Hospitalized Hemorrhagic Stroke	**112**	**121**	**110**	**96**	**106**	**117**	**131**	**144**
Total Number of Stroke Hospitalizations	**600**	**676**	**618**	**606**	**597**	**641**	**625**	**629**
Average Length of Stay in Acute Care								
Incident Stroke Patients								
Hospitalized Ischemic Stroke	33.46	34.45	32.58	34.59	32.07	35.89	31.77	28.83
Hospitalized Hemorrhagic Stroke	41.86	39.49	29.61	34.77	37.60	45.64	51.73	29.82
Readmission								
Hospitalized Ischemic Stroke	29.92	14.07	40.33	7.63	58.33	29.11	9.40	16.72
Hospitalized Hemorrhagic Stroke	10.00		55.50	24.00	53.00	6.00	15.50	34.67
Recurrence								
Hospitalized Ischemic Stroke	37.33	35.41	26.95	41.87	44.39	33.93	22.35	20.81
Hospitalized Hemorrhagic Stroke	18.86	37.40	25.00	20.50	11.70	17.00	77.45	45.00
Total Hospitalized Ischemic Stroke	**34.00**	**34.04**	**31.83**	**35.13**	**34.01**	**35.51**	**30.28**	**27.07**
Total Hospitalized Hemorrhagic Stroke	**39.86**	**39.31**	**29.62**	**33.35**	**35.59**	**42.37**	**53.34**	**31.08**
Total Number of Stroke Hospitalizations	**35.09**	**34.98**	**31.44**	**34.84**	**34.29**	**36.76**	**35.12**	**27.99**
Days in Acute Care								
Number of Incident Stroke Patients								
Hospitalized Ischemic Stroke	13,215	15,776	13,879	15,048	13,372	15,934	13,438	11,185
Hospitalized Hemorrhagic Stroke	4,312	4,383	2,872	2,990	3,497	4,747	6,104	3,876
Readmission								
Hospitalized Ischemic Stroke	389	211	242	61	175	262	47	301
Hospitalized Hemorrhagic Stroke	20	-	111	48	159	6	31	104
Recurrence								
Hospitalized Ischemic Stroke	2,986	2,904	2,048	2,805	3,152	2,409	1,475	1,644
Hospitalized Hemorrhagic Stroke	132	374	275	164	117	204	852	495
Total Days - Hospitalized Ischemic Stroke	**16,590**	**18,891**	**16,169**	**17,914**	**16,699**	**18,605**	**14,960**	**13,130**
Total Days - Hospitalized Hemorrhagic Stroke	**4,464**	**4,757**	**3,258**	**3,202**	**3,773**	**4,957**	**6,987**	**4,475**
Total Days	**21,054**	**23,648**	**19,427**	**21,116**	**20,472**	**23,562**	**21,947**	**17,605**

* Age 20 and older

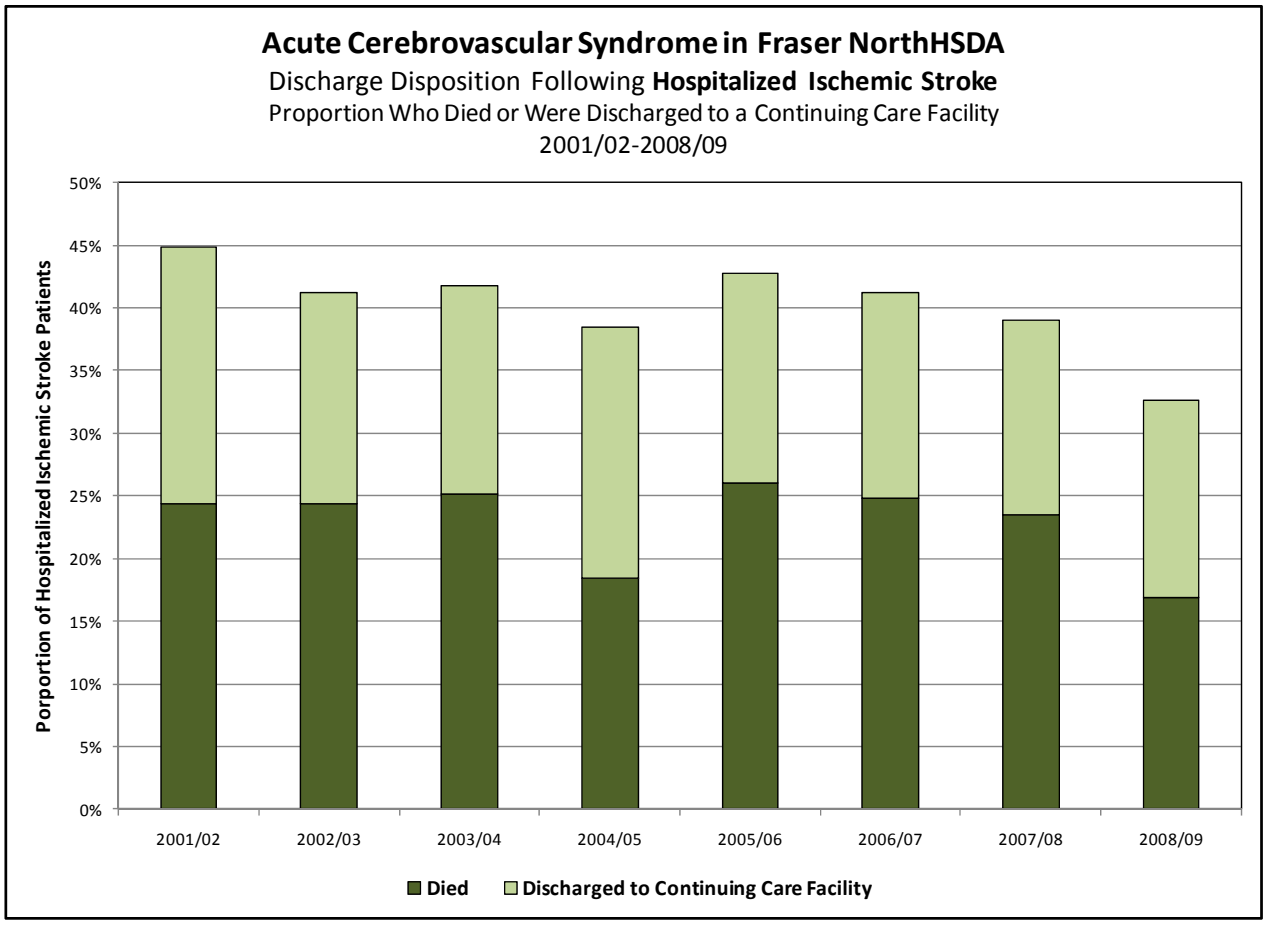
Recurrent stroke admissions *are defined as any hospitalization for stroke following an incident hospitalized stroke, with the exception of admissions within 28 days for the same stroke type (ischemic or hemorrhagic), which are considered* ***readmissions****.*

Indicator #5 – Death and Dependency

Reduce the proportion of patients who die in hospital or are sent to a long- term care facility after being admitted/discharged (principal diagnosis) for ischemic stroke. *If only one composite measure is used to assess progress in stroke care, it would be this overall measure of death and dependency.*

> *Data Source:* Updated ACVS Registry for hospitalized (incident, readmission and recurrent) ischemic stroke discharges. Discharge Abstract Database (DAD) for discharge disposition ('died', 'discharged to a Continuing Care facility').

Fraser North HSDA – Discharge Disposition for Hospitalized Ischemic Stroke



Indicator #5 – Death and Dependency (continued)

Fraser North HSDA – Discharge Disposition Data Trends

Discharge Disposition Following a Hospitalization for Stroke
Patient Died or Was Discharged to a Continuing Care Facility
Adults* Residing in Fraser North HSDA
2001/02 to 2008/09

	Fiscal Year							
	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09
Number of Stroke Hospitalizations								
Number of Incident Stroke Patients								
Hospitalized Ischemic Stroke	395	458	426	435	417	444	423	388
Hospitalized Hemorrhagic Stroke	103	111	97	86	93	104	118	130
Readmission								
Hospitalized Ischemic Stroke	13	15	6	8	[redacted]	9	5	18
Hospitalized Hemorrhagic Stroke	[redacted]	-	[redacted]					
Recurrence								
Hospitalized Ischemic Stroke	80	82	76	67	71	71	66	79
Hospitalized Hemorrhagic Stroke	7	10	11	8	10	12	11	11
Total Hospitalized Ischemic Stroke	**488**	**555**	**508**	**510**	**491**	**524**	**494**	**485**
Total Hospitalized Hemorrhagic Stroke	**112**	**121**	**110**	**96**	**106**	**117**	**131**	**144**
Total Number of Stroke Hospitalizations	**600**	**676**	**618**	**606**	**597**	**641**	**625**	**629**
Discharge Disposition - Number								
Incident Stroke Patients								
Hospitalized Ischemic Stroke								
Died	98	106	110	79	101	106	102	66
Discharged to a Continuing Care Facility	69	81	71	84	64	69	61	62
Hospitalized Hemorrhagic Stroke								
Died	41	49	33	26	19	30	35	44
Discharged to a Continuing Care Facility	13	13	9	9	17	14	17	15
Readmission								
Hospitalized Ischemic Stroke								
Died	[redacted]		-	[redacted]			-	[redacted]
Discharged to a Continuing Care Facility	[redacted]					-	-	
Hospitalized Hemorrhagic Stroke								
Died	-	-	-	-	[redacted]	-	-	-
Discharged to a Continuing Care Facility	-	-	-	-		-	-	[redacted]
Recurrence								
Hospitalized Ischemic Stroke								
Died	19	28	18	13	26	20	14	15
Discharged to a Continuing Care Facility	27	11	11	17	16	17	16	11
Hospitalized Hemorrhagic Stroke								
Died	5	[redacted]	6	[redacted]	6	6	[redacted]	
Discharged to a Continuing Care Facility	-			-	-			
Total Hospitalized Ischemic Stroke								
Died	**119**	**135**	**128**	**94**	**128**	**130**	**116**	**82**
Discharged to a Continuing Care Facility	**100**	**94**	**84**	**102**	**82**	**86**	**77**	**76**
Death and Disability	**219**	**229**	**212**	**196**	**210**	**216**	**193**	**158**
Total Hospitalized Hemorrhagic Stroke								
Died	**46**	**53**	**39**	**28**	**26**	**36**	**36**	**46**
Discharged to a Continuing Care Facility	**13**	**14**	**12**	**9**	**18**	**15**	**19**	**19**
Death and Disability	**59**	**67**	**51**	**37**	**44**	**51**	**55**	**65**
Total Number of Stroke Hospitalizations								
Died	**165**	**188**	**167**	**122**	**154**	**166**	**152**	**128**
Discharged to a Continuing Care Facility	**113**	**108**	**96**	**111**	**100**	**101**	**96**	**95**
Death and Disability	**278**	**296**	**263**	**233**	**254**	**267**	**248**	**223**
Discharge Disposition - Proportion								
Incident Stroke Patients								
Hospitalized Ischemic Stroke								
Died	24.8%	23.1%	25.8%	18.2%	24.2%	23.9%	24.1%	17.0%
Discharged to a Continuing Care Facility	17.5%	17.7%	16.7%	19.3%	15.3%	15.5%	14.4%	16.0%
Hospitalized Hemorrhagic Stroke								
Died	39.8%	44.1%	34.0%	30.2%	20.4%	28.8%	29.7%	33.8%
Discharged to a Continuing Care Facility	12.6%	11.7%	9.3%	10.5%	18.3%	13.5%	14.4%	11.5%
Readmission								
Hospitalized Ischemic Stroke								
Died	15.4%	6.7%	0.0%	25.0%	33.3%	44.4%	0.0%	5.6%
Discharged to a Continuing Care Facility	30.8%	13.3%	33.3%	12.5%	66.7%	0.0%	0.0%	16.7%
Hospitalized Hemorrhagic Stroke								
Died	0.0%		0.0%	0.0%	33.3%	0.0%	0.0%	0.0%
Discharged to a Continuing Care Facility	0.0%		0.0%	0.0%	33.3%	0.0%	0.0%	33.3%
Recurrence								
Hospitalized Ischemic Stroke								
Died	23.8%	34.1%	23.7%	19.4%	36.6%	28.2%	21.2%	19.0%
Discharged to a Continuing Care Facility	33.8%	13.4%	14.5%	25.4%	22.5%	23.9%	24.2%	13.9%
Hospitalized Hemorrhagic Stroke								
Died	71.4%	40.0%	54.5%	25.0%	60.0%	50.0%	9.1%	18.2%
Discharged to a Continuing Care Facility	0.0%	10.0%	27.3%	0.0%	0.0%	8.3%	18.2%	27.3%
Total Hospitalized Ischemic Stroke								
Died	**24.4%**	**24.3%**	**25.2%**	**18.4%**	**26.1%**	**24.8%**	**23.5%**	**16.9%**
Discharged to a Continuing Care Facility	**20.5%**	**16.9%**	**16.5%**	**20.0%**	**16.7%**	**16.4%**	**15.6%**	**15.7%**
Death and Disability	**44.9%**	**41.3%**	**41.7%**	**38.4%**	**42.8%**	**41.2%**	**39.1%**	**32.6%**
Total Hospitalized Hemorrhagic Stroke								
Died	**41.1%**	**43.8%**	**35.5%**	**29.2%**	**24.5%**	**30.8%**	**27.5%**	**31.9%**
Discharged to a Continuing Care Facility	**11.6%**	**11.6%**	**10.9%**	**9.4%**	**17.0%**	**12.8%**	**14.5%**	**13.2%**
Death and Disability	**52.7%**	**55.4%**	**46.4%**	**38.5%**	**41.5%**	**43.6%**	**42.0%**	**45.1%**
Total Number of Stroke Hospitalizations								
Died	**27.5%**	**27.8%**	**27.0%**	**20.1%**	**25.8%**	**25.9%**	**24.3%**	**20.3%**
Discharged to a Continuing Care Facility	**18.8%**	**16.0%**	**15.5%**	**18.3%**	**16.8%**	**15.8%**	**15.4%**	**15.1%**
Death and Disability	**46.3%**	**43.8%**	**42.6%**	**38.4%**	**42.5%**	**41.7%**	**39.7%**	**35.5%**

* Age 20 and older

Recurrent stroke admissions *are defined as any hospitalization for stroke following an incident hospitalized stroke, with the exception of admissions within 28 days for the same stroke type (ischemic or hemorrhagic), which are considered* ***readmissions****.*

FRASER SOUTH HSDA

Indicators and Metrics

FRASER SOUTH HSDA
INDICATORS AND METRICS AS OF NOVEMBER 2010

Acute Cerebrovascular Syndrome
Adults* Residing in the Fraser South HSDA
2001/02 to 2008/09

	Fiscal Year								% Change
	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	01/02 to 08/09
Number of Incident ACVS Patients									
Hospitalized Ischemic Stroke	572	513	516	517	544	524	556	537	-6.1%
Hospitalized Hemorrhagic Stroke	124	102	109	114	131	116	127	118	-4.8%
Sub-total	**696**	**615**	**625**	**631**	**675**	**640**	**683**	**655**	**-5.9%**
Hospitalized TIA	173	162	133	140	193	164	176	199	15.0%
Non-hospitalized TIA/Stroke	470	585	558	604	597	578	666	767	63.2%
Sub-total	**643**	**747**	**691**	**744**	**790**	**742**	**842**	**966**	**50.2%**
Number of Prevalent ACVS Patients									
Hospitalized Ischemic Stroke	2,896	2,966	3,069	3,146	3,252	3,365	3,433	3,556	22.8%
Hospitalized Hemorrhagic Stroke	617	632	677	728	775	801	853	883	43.1%
Sub-total	**3,513**	**3,598**	**3,746**	**3,874**	**4,027**	**4,166**	**4,286**	**4,439**	**26.4%**
Hospitalized TIA	1,089	1,154	1,189	1,213	1,292	1,321	1,370	1,435	31.8%
Non-hospitalized TIA/Stroke	2,992	3,304	3,601	3,886	4,140	4,407	4,736	5,149	72.1%
Sub-total	**4,081**	**4,458**	**4,790**	**5,099**	**5,432**	**5,728**	**6,106**	**6,584**	**61.3%**
Age-Standardized Incidence / 1,000 Population									
Hospitalized Ischemic Stroke	1.111	0.958	0.921	0.905	0.903	0.832	0.852	0.796	-28.3%
Hospitalized Hemorrhagic Stroke	0.232	0.185	0.189	0.191	0.212	0.181	0.195	0.176	-24.2%
Sub-total	**1.352**	**1.150**	**1.117**	**1.103**	**1.123**	**1.020**	**1.055**	**0.979**	**-27.6%**
Hospitalized TIA	0.330	0.296	0.233	0.242	0.315	0.258	0.266	0.292	-11.3%
Non-hospitalized TIA/Stroke	0.911	1.094	1.008	1.059	1.010	0.941	1.039	1.156	26.9%
Age-Standardized Prevalence / 1,000 Population									
Hospitalized Ischemic Stroke	5.267	5.205	5.172	5.121	5.103	5.067	4.984	4.963	-5.8%
Hospitalized Hemorrhagic Stroke	1.116	1.106	1.139	1.187	1.224	1.223	1.262	1.259	12.8%
Sub-total	**6.383**	**6.311**	**6.311**	**6.309**	**6.327**	**6.290**	**6.246**	**6.222**	**-2.5%**
Hospitalized TIA	1.982	2.025	2.002	1.976	2.023	1.990	1.987	2.004	1.1%
Non-hospitalized TIA/Stroke	5.732	6.109	6.404	6.694	6.880	7.038	7.281	7.603	32.6%
Conversion Rate from TIA/Non-hospitalized Stroke to Hospitalized Stroke									
90-Day Conversion Rate	3.42%	3.31%	1.79%	2.80%	3.27%	3.48%	1.72%		
365-Day Conversion Rate	5.05%	4.27%	4.02%	4.06%	4.58%	4.45%	3.20%		
Utilization of tPA by Incident Acute Ischemic Stroke Patients									
Number Receiving tPA						19	15	29	
Total Number						524	556	537	
Proportion of Incident Hospitalized AIS Patients Receiving tPA						3.63%	2.70%	5.40%	
Utilization of Acute Care by Incident Ischemic Stroke Patients									
Discharges	572	513	516	517	544	524	556	537	-6.1%
ALOS	32.39	34.65	31.49	27.90	30.76	27.40	29.27	24.30	-25.0%
Patient Days	18,525	17,778	16,248	14,423	16,734	14,358	16,276	13,048	-29.6%
Utilization of Acute Care by Incident Hemorrhagic Stroke Patients									
Discharges	124	102	109	114	131	116	127	118	-4.8%
ALOS	34.90	36.05	33.63	36.14	34.89	42.46	36.83	28.23	-19.1%
Patient Days	4,328	3,677	3,666	4,120	4,570	4,925	4,677	3,331	-23.0%
Discharge Disposition following Acute Admissions for Incident Ischemic Stroke Patients									
Died	30.2%	27.3%	24.6%	24.0%	23.3%	27.1%	22.7%	23.8%	-21.2%
Discharged to Home	46.3%	49.1%	49.2%	51.5%	50.2%	47.5%	49.1%	51.6%	11.3%
Home with Support Services	7.2%	7.0%	8.9%	8.7%	8.6%	7.8%	10.1%	7.6%	6.5%
Continuing Care Facility	14.5%	15.4%	16.3%	14.7%	15.4%	14.5%	15.5%	13.0%	-10.2%
Other	1.7%	1.2%	1.0%	1.2%	2.4%	3.1%	2.7%	3.9%	123.7%
Discharge Disposition following Acute Admissions for Incident Hemorrhagic Stroke Patients									
Died	39.5%	34.3%	43.1%	36.8%	35.1%	25.9%	40.9%	35.6%	-9.9%
Discharged to Home	44.4%	52.0%	42.2%	40.4%	45.8%	50.0%	38.6%	44.9%	1.3%
Home with Support Services	3.2%	2.9%	7.3%	5.3%	6.1%	5.2%	5.5%	3.4%	5.1%
Continuing Care Facility	8.1%	6.9%	5.5%	11.4%	9.2%	12.1%	10.2%	5.1%	-36.9%
Other	4.8%	3.9%	1.8%	6.1%	3.8%	6.9%	4.7%	11.0%	127.7%
Mortality Following an Incident Stroke									
Hospitalized Ischemic Stroke									
Crude 30-day In-hospital Mortality Rate	21.7%	21.6%	18.8%	19.1%	17.8%	19.8%	17.4%	18.6%	-14.1%
Crude 31-365 Day Mortality Rate in 30-day In-hospital Survivors	20.3%	17.2%	21.7%	17.5%	18.6%	25.7%	16.3%	21.3%	4.8%
Hospitalized Hemorrhagic Stroke									
Crude 30-day In-hospital Mortality Rate	35.5%	29.4%	40.4%	35.1%	32.8%	23.3%	35.4%	33.9%	-4.5%
Crude 31-365 Day Mortality Rate in 30-day In-hospital Survivors	12.5%	9.7%	16.9%	12.2%	14.8%	13.5%	17.1%	12.8%	2.6%

Grey Shading = Not Applicable/Available

Underlined % are based on a numerator of less than 5

* Age 20 and older

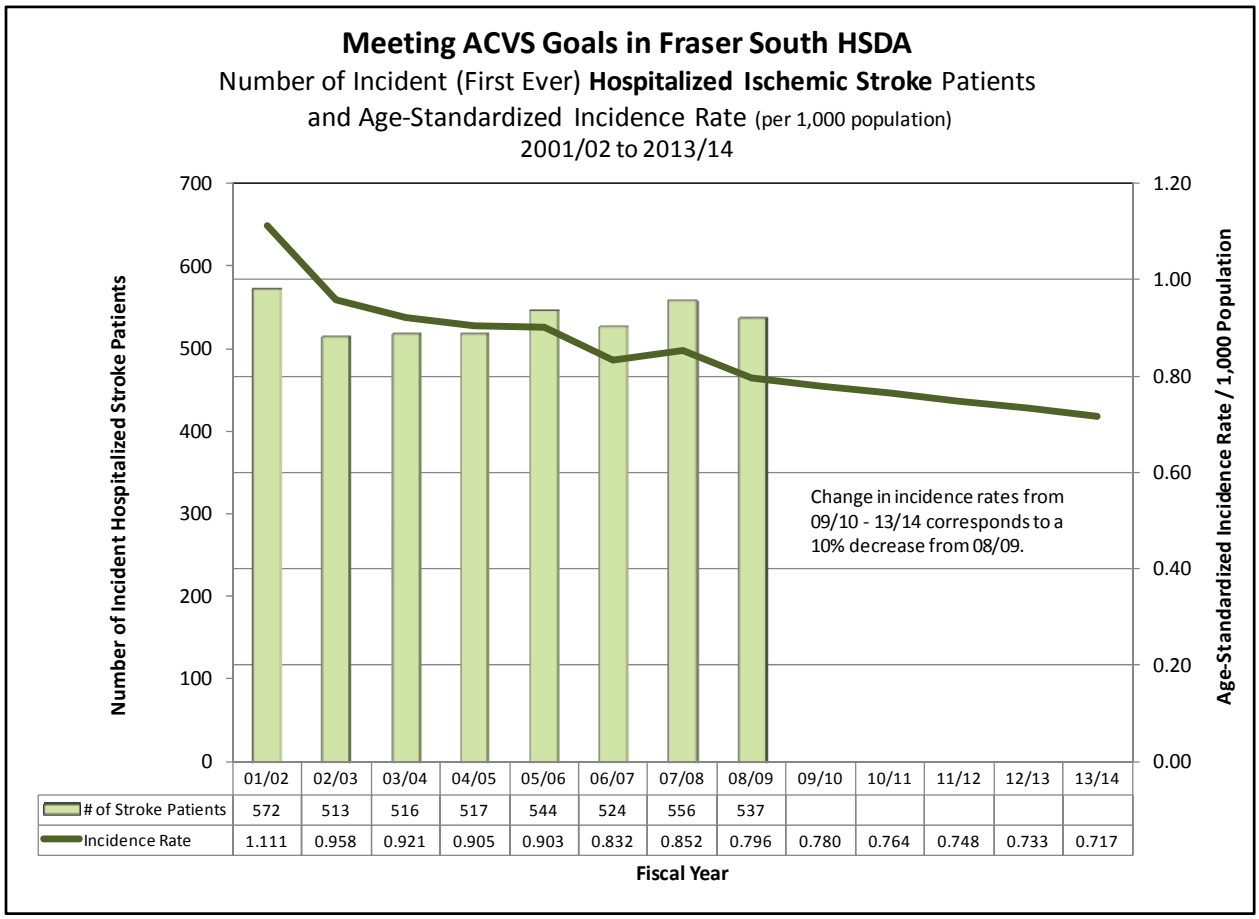
FRASER SOUTH HSDA
INDICATORS AND METRICS

The BC Stroke Strategy Measurement and Evaluation Working Group have suggested five key indicators for tracking progress on ACVS care in the province. The following charts and tables include trend data for **Fraser South HSDA** for three of these five indicators. The source of this data is from the updated Acute Cerebrovascular Syndrome (ACVS) Registry. Note that the geographic location is based on the patient's residence, not necessarily the location of their treatment.

Indicator #3 – Incidence Rate

Reduce the age-standardized incidence rate of both ischemic and hemorrhagic stroke by **10%** between 2008/09 and 2013/14 (*data source:* updated ACVS Registry).

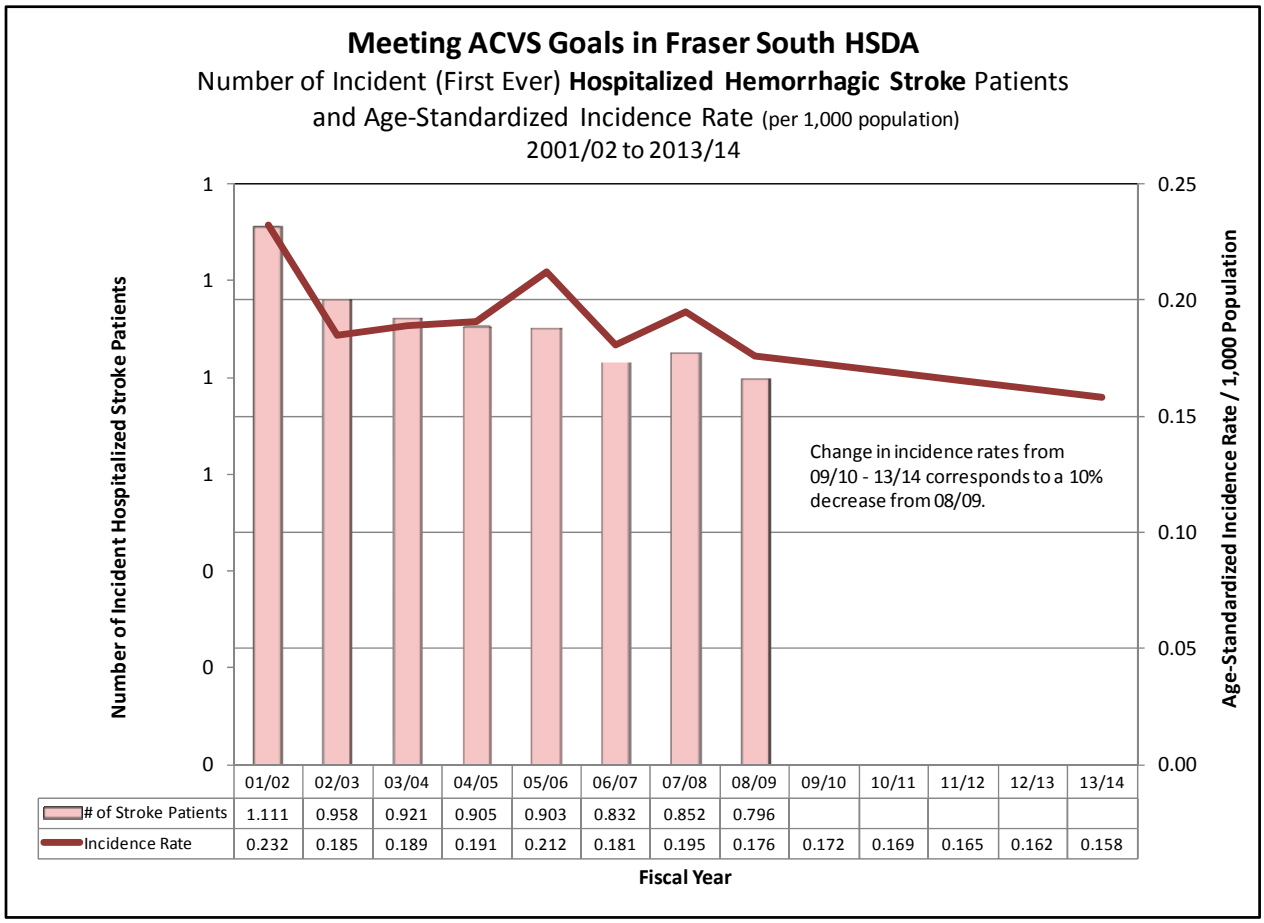
Fraser South HSDA – Incident Hospitalized Ischemic Stroke Patients



	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11	11/12	12/13	13/14
# of Stroke Patients	572	513	516	517	544	524	556	537					
Incidence Rate	1.111	0.958	0.921	0.905	0.903	0.832	0.852	0.796	0.780	0.764	0.748	0.733	0.717

Indicator #3 – Incidence Rate (continued)

Fraser South HSDA – Incident Hospitalized Hemorrhagic Stroke Patients



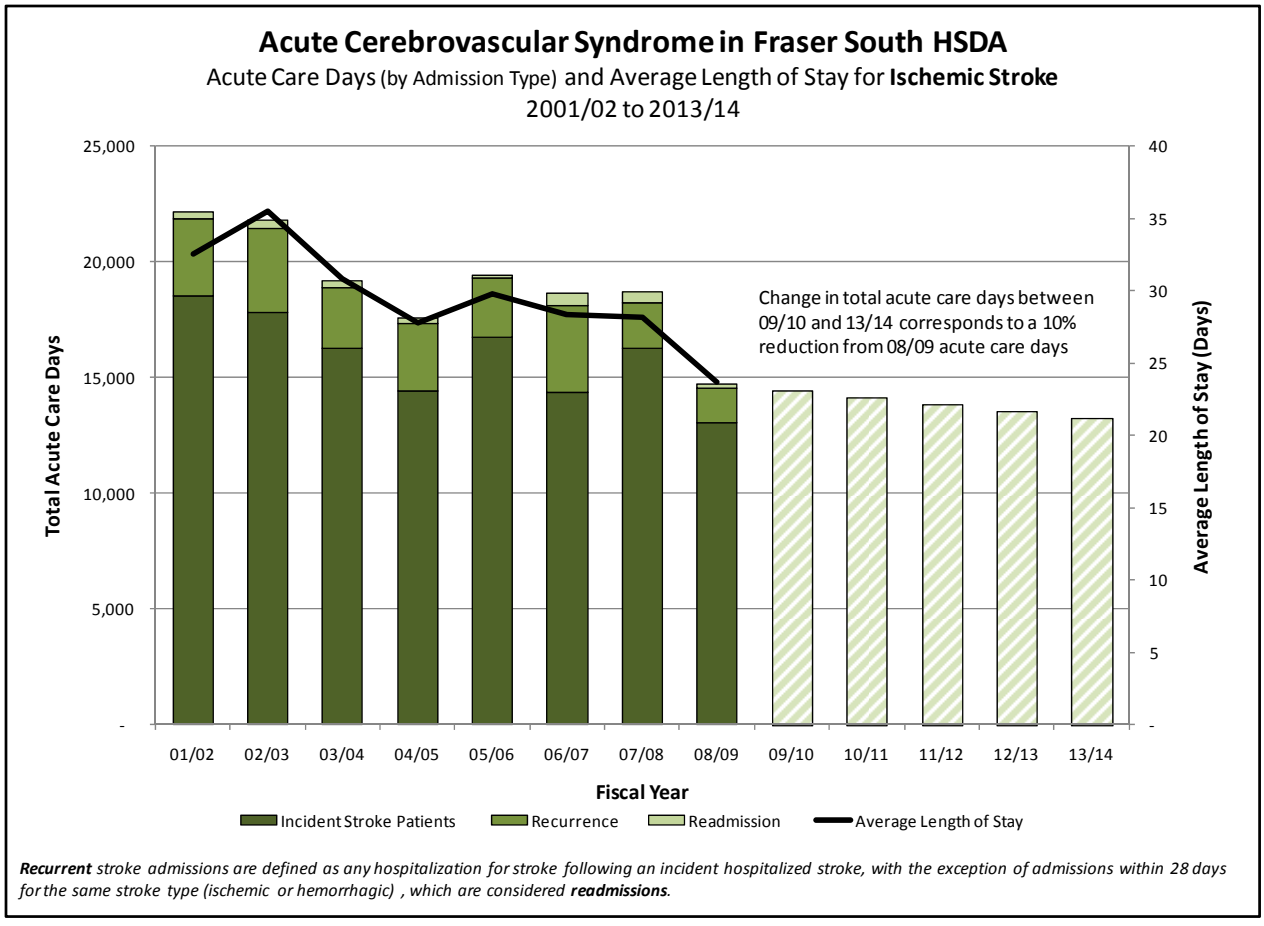
	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11	11/12	12/13	13/14
# of Stroke Patients	1.111	0.958	0.921	0.905	0.903	0.832	0.852	0.796					
Incidence Rate	0.232	0.185	0.189	0.191	0.212	0.181	0.195	0.176	0.172	0.169	0.165	0.162	0.158

Indicator #4 – Acute Care Days

Reduce acute care days for discharges in which an ischemic stroke is the principal diagnosis by **10%** between 2008/09 and 2013/14 (this includes a combination of reduced discharges and reduced average length of stay).

Data Source: Updated ACVS Registry for incident, re-admit and recurrent ischemic stroke discharges. Link to the Discharge Abstract Database (DAD) for number of hospital days associated with these discharges. **Recurrent** stroke admissions are defined as any hospitalization for stroke following an incident hospitalized stroke, with the exception of admissions within 28 days for the same stroke type (ischemic or hemorrhagic), which are considered **readmissions**.

Fraser South HSDA – Acute Care Days and ALOS for Ischemic Stroke Patients



Recurrent *stroke admissions are defined as any hospitalization for stroke following an incident hospitalized stroke, with the exception of admissions within 28 days for the same stroke type (ischemic or hemorrhagic) , which are considered* ***readmissions****.*

Indicator #4 – Acute Care Days (continued)

Fraser South HSDA – Hospitalization and ALOS Data Trends

Hospitalization and ALOS for Stroke
Adults* Residing in Fraser South HSDA
2001/02 to 2008/09

	Fiscal Year							
	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09
Number of Stroke Hospitalizations								
Number of Incident Stroke Patients								
Hospitalized Ischemic Stroke	572	513	516	517	544	524	556	537
Hospitalized Hemorrhagic Stroke	124	102	109	114	131	116	127	118
Readmission								
Hospitalized Ischemic Stroke	16	11	10	16	12	19	17	8
Hospitalized Hemorrhagic Stroke	[redacted]		-	-	[redacted]			
Recurrence								
Hospitalized Ischemic Stroke	92	89	97	99	97	115	90	77
Hospitalized Hemorrhagic Stroke	10	13	10	17	15	9	14	6
Total Hospitalized Ischemic Stroke	**680**	**613**	**623**	**632**	**653**	**658**	**663**	**622**
Total Hospitalized Hemorrhagic Stroke	**135**	**117**	**119**	**131**	**149**	**126**	**142**	**126**
Total Number of Stroke Hospitalizations	**815**	**730**	**742**	**763**	**802**	**784**	**805**	**748**
Average Length of Stay in Acute Care								
Incident Stroke Patients								
Hospitalized Ischemic Stroke	32.39	34.65	31.49	27.90	30.76	27.40	29.27	24.30
Hospitalized Hemorrhagic Stroke	34.90	36.05	33.63	36.14	34.89	42.46	36.83	28.23
Readmission								
Hospitalized Ischemic Stroke	18.88	28.36	31.00	13.63	13.50	27.89	27.76	20.88
Hospitalized Hemorrhagic Stroke	5.00	124.50			40.00	4.00	23.00	16.50
Recurrence								
Hospitalized Ischemic Stroke	36.17	41.42	27.21	29.44	26.11	32.72	21.62	19.61
Hospitalized Hemorrhagic Stroke	7.90	42.77	14.10	26.18	37.67	51.89	22.21	7.17
Total Hospitalized Ischemic Stroke	**32.58**	**35.52**	**30.81**	**27.78**	**29.75**	**28.34**	**28.20**	**23.67**
Total Hospitalized Hemorrhagic Stroke	**32.68**	**38.31**	**31.99**	**34.85**	**35.27**	**42.83**	**35.29**	**27.04**
Total Number of Stroke Hospitalizations	**32.60**	**35.97**	**31.00**	**28.99**	**30.78**	**30.67**	**29.45**	**24.24**
Days in Acute Care								
Number of Incident Stroke Patients								
Hospitalized Ischemic Stroke	18,525	17,778	16,248	14,423	16,734	14,358	16,276	13,048
Hospitalized Hemorrhagic Stroke	4,328	3,677	3,666	4,120	4,570	4,925	4,677	3,331
Readmission								
Hospitalized Ischemic Stroke	302	312	310	218	162	530	472	167
Hospitalized Hemorrhagic Stroke	5	249	-	-	120	[redacted]	23	33
Recurrence								
Hospitalized Ischemic Stroke	3,328	3,686	2,639	2,915	2,533	3,763	1,946	1,510
Hospitalized Hemorrhagic Stroke	79	556	141	445	565	467	311	43
Total Days - Hospitalized Ischemic Stroke	**22,155**	**21,776**	**19,197**	**17,556**	**19,429**	**18,651**	**18,694**	**14,725**
Total Days - Hospitalized Hemorrhagic Stroke	**4,412**	**4,482**	**3,807**	**4,565**	**5,255**	**5,396**	**5,011**	**3,407**
Total Days	**26,567**	**26,258**	**23,004**	**22,121**	**24,684**	**24,047**	**23,705**	**18,132**

* Age 20 and older

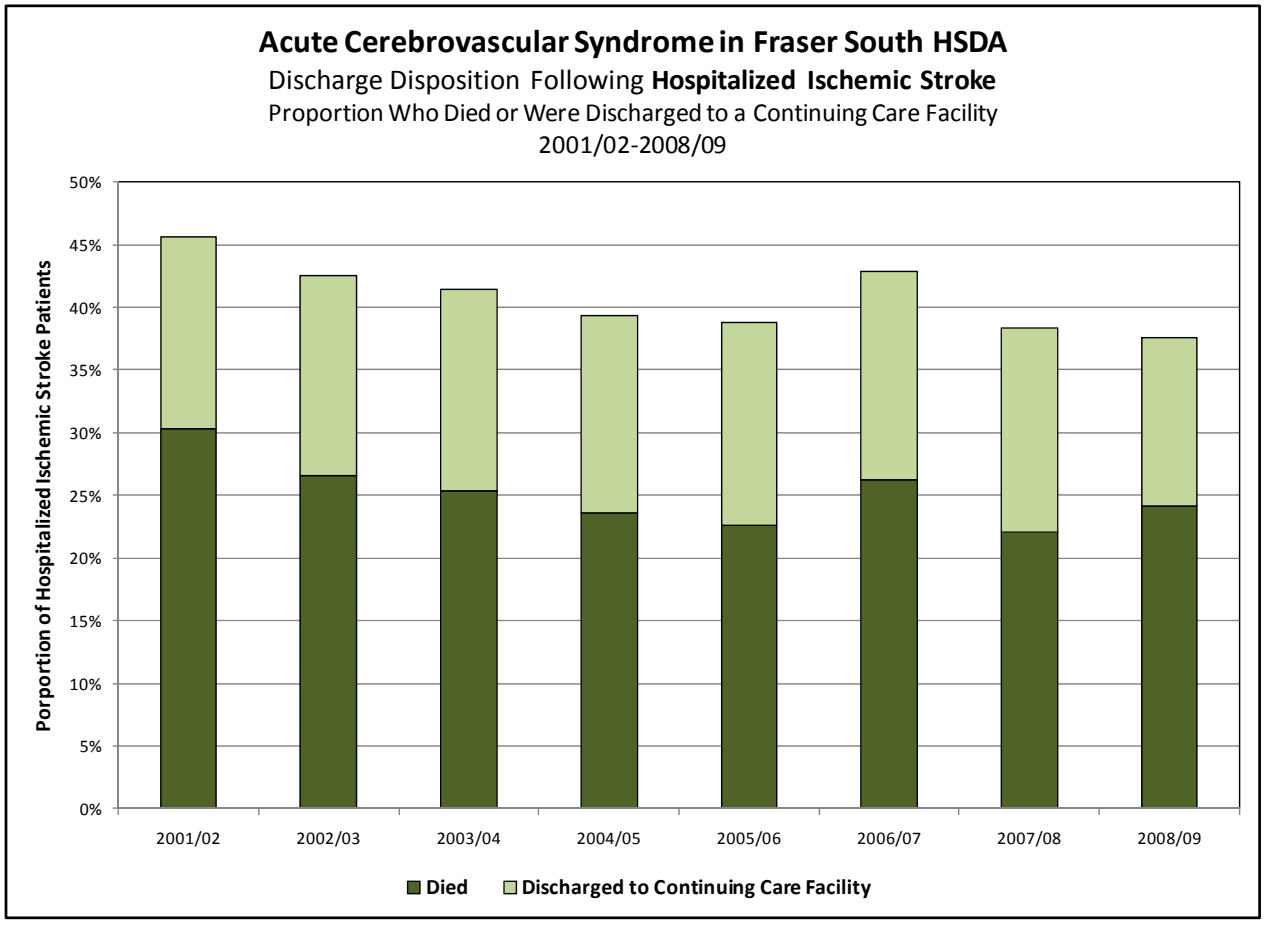
Recurrent stroke admissions *are defined as any hospitalization for stroke following an incident hospitalized stroke, with the exception of admissions within 28 days for the same stroke type (ischemic or hemorrhagic), which are considered* ***readmissions****.*

Indicator #5 – Death and Dependency

Reduce the proportion of patients who die in hospital or are sent to a long- term care facility after being admitted/discharged (principal diagnosis) for ischemic stroke. *If only one composite measure is used to assess progress in stroke care, it would be this overall measure of death and dependency.*

> *Data Source:* Updated ACVS Registry for hospitalized (incident, readmission and recurrent) ischemic stroke discharges. Discharge Abstract Database (DAD) for discharge disposition ('died', 'discharged to a Continuing Care facility').

Fraser South HSDA – Discharge Disposition for Hospitalized Ischemic Stroke



Indicator #5 – Death and Dependency (continued)

Fraser South HSDA – Discharge Disposition Data Trends

Discharge Disposition Following a Hospitalization for Stroke

Patient Died or Was Discharged to a Continuing Care Facility

Adults* Residing in Fraser South HSDA

2001/02 to 2008/09

	Fiscal Year							
	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09
Number of Stroke Hospitalizations								
Number of Incident Stroke Patients								
Hospitalized Ischemic Stroke	572	513	516	517	544	524	556	537
Hospitalized Hemorrhagic Stroke	124	102	109	114	131	116	127	118
Readmission								
Hospitalized Ischemic Stroke	16	11	10	16	12	19	17	8
Hospitalized Hemorrhagic Stroke	[redacted]		-	-	[redacted]			
Recurrence								
Hospitalized Ischemic Stroke	92	89	97	99	97	115	90	77
Hospitalized Hemorrhagic Stroke	10	13	10	17	15	9	14	6
Total Hospitalized Ischemic Stroke	**680**	**613**	**623**	**632**	**653**	**658**	**663**	**622**
Total Hospitalized Hemorrhagic Stroke	**135**	**117**	**119**	**131**	**149**	**126**	**142**	**126**
Total Number of Stroke Hospitalizations	**815**	**730**	**742**	**763**	**802**	**784**	**805**	**748**
Discharge Disposition - Number								
Incident Stroke Patients								
Hospitalized Ischemic Stroke								
Died	173	140	127	124	127	142	126	128
Discharged to a Continuing Care Facility	83	79	84	76	84	76	86	70
Hospitalized Hemorrhagic Stroke								
Died	49	35	47	42	46	30	52	42
Discharged to a Continuing Care Facility	10	7	6	13	12	14	13	6
Readmission								
Hospitalized Ischemic Stroke								
Died	[redacted]					8		
Discharged to a Continuing Care Facility		-	-					-
Hospitalized Hemorrhagic Stroke								
Died	-	-	-	-	-	-	-	
Discharged to a Continuing Care Facility	-	-	-	-			-	-
Recurrence								
Hospitalized Ischemic Stroke								
Died	30	21	29	24	18	23	17	20
Discharged to a Continuing Care Facility	19	19	16	22	20	29	18	14
Hospitalized Hemorrhagic Stroke								
Died	8	[redacted]		11	6	6	8	5
Discharged to a Continuing Care Facility	-							-
Total Hospitalized Ischemic Stroke								
Died	**206**	**163**	**158**	**149**	**148**	**173**	**146**	**150**
Discharged to a Continuing Care Facility	**104**	**98**	**100**	**100**	**105**	**109**	**108**	**84**
Death and Disability	**310**	**261**	**258**	**249**	**253**	**282**	**254**	**234**
Total Hospitalized Hemorrhagic Stroke								
Died	**57**	**39**	**48**	**53**	**52**	**36**	**60**	**48**
Discharged to a Continuing Care Facility	**10**	**11**	**7**	**16**	**16**	**17**	**14**	**6**
Death and Disability	**67**	**50**	**55**	**69**	**68**	**53**	**74**	**54**
Total Number of Stroke Hospitalizations								
Died	**263**	**202**	**206**	**202**	**200**	**209**	**206**	**198**
Discharged to a Continuing Care Facility	**114**	**109**	**107**	**116**	**121**	**126**	**122**	**90**
Death and Disability	**377**	**311**	**313**	**318**	**321**	**335**	**328**	**288**
Discharge Disposition - Proportion								
Incident Stroke Patients								
Hospitalized Ischemic Stroke								
Died	30.2%	27.3%	24.6%	24.0%	23.3%	27.1%	22.7%	23.8%
Discharged to a Continuing Care Facility	14.5%	15.4%	16.3%	14.7%	15.4%	14.5%	15.5%	13.0%
Hospitalized Hemorrhagic Stroke								
Died	39.5%	34.3%	43.1%	36.8%	35.1%	25.9%	40.9%	35.6%
Discharged to a Continuing Care Facility	8.1%	6.9%	5.5%	11.4%	9.2%	12.1%	10.2%	5.1%
Readmission								
Hospitalized Ischemic Stroke								
Died	18.8%	18.2%	20.0%	6.3%	25.0%	42.1%	17.6%	25.0%
Discharged to a Continuing Care Facility	12.5%	0.0%	0.0%	12.5%	8.3%	21.1%	23.5%	0.0%
Hospitalized Hemorrhagic Stroke								
Died	0.0%	0.0%			0.0%	0.0%	0.0%	50.0%
Discharged to a Continuing Care Facility	0.0%	0.0%			33.3%	100.0%	0.0%	0.0%
Recurrence								
Hospitalized Ischemic Stroke								
Died	32.6%	23.6%	29.9%	24.2%	18.6%	20.0%	18.9%	26.0%
Discharged to a Continuing Care Facility	20.7%	21.3%	16.5%	22.2%	20.6%	25.2%	20.0%	18.2%
Hospitalized Hemorrhagic Stroke								
Died	80.0%	30.8%	10.0%	64.7%	40.0%	66.7%	57.1%	83.3%
Discharged to a Continuing Care Facility	0.0%	30.8%	10.0%	17.6%	20.0%	22.2%	7.1%	0.0%
Total Hospitalized Ischemic Stroke								
Died	**30.3%**	**26.6%**	**25.4%**	**23.6%**	**22.7%**	**26.3%**	**22.0%**	**24.1%**
Discharged to a Continuing Care Facility	**15.3%**	**16.0%**	**16.1%**	**15.8%**	**16.1%**	**16.6%**	**16.3%**	**13.5%**
Death and Disability	**45.6%**	**42.6%**	**41.4%**	**39.4%**	**38.7%**	**42.9%**	**38.3%**	**37.6%**
Total Hospitalized Hemorrhagic Stroke								
Died	**42.2%**	**33.3%**	**40.3%**	**40.5%**	**34.9%**	**28.6%**	**42.3%**	**38.1%**
Discharged to a Continuing Care Facility	**7.4%**	**9.4%**	**5.9%**	**12.2%**	**10.7%**	**13.5%**	**9.9%**	**4.8%**
Death and Disability	**49.6%**	**42.7%**	**46.2%**	**52.7%**	**45.6%**	**42.1%**	**52.1%**	**42.9%**
Total Number of Stroke Hospitalizations								
Died	**32.3%**	**27.7%**	**27.8%**	**26.5%**	**24.9%**	**26.7%**	**25.6%**	**26.5%**
Discharged to a Continuing Care Facility	**14.0%**	**14.9%**	**14.4%**	**15.2%**	**15.1%**	**16.1%**	**15.2%**	**12.0%**
Death and Disability	**46.3%**	**42.6%**	**42.2%**	**41.7%**	**40.0%**	**42.7%**	**40.7%**	**38.5%**

* Age 20 and older

Recurrent stroke admissions *are defined as any hospitalization for stroke following an incident hospitalized stroke, with the exception of admissions within 28 days for the same stroke type (ischemic or hemorrhagic), which are considered* ***readmissions****.*