Appendix 3: Economic Model

Economic Evaluation of Keewaytinook Okimakanak Telehealth/ NORTH Network Expansion Project: A cost comparison approach

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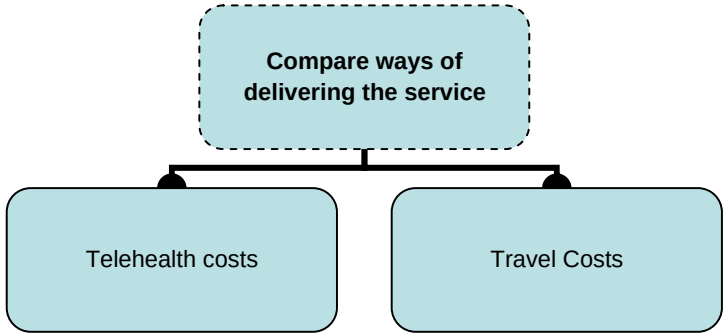
Economic Evaluation

Background

The Keewaytinook Okimakanak Telehealth/NORTH Network Expansion Project ran for 31 months from September 2003 to March 2006. The telehealth network was expanded, in stages, from 5 First Nations communities to a total of 24 First Nations communities located in the Sioux Lookout Health Zone. Additional First Nations communities, located in other health zones, have been added **but are not included in this economic model**. The telecommunications network used ground and satellite links to provide health consultations, educational/training sessions and administrative meetings for people living in First Nations communities.

Approach

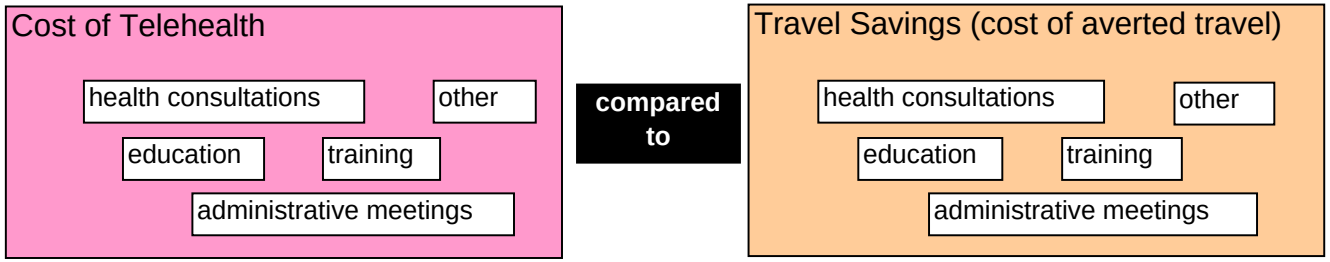
The economic evaluation uses a modeling approach that compares the cost of delivering the service by telehealth to the cost of delivering the service by transporting the user.



Model Steps

1. Calculate the total cost of all telehealth sessions for all major categories of use. Major categories include: health (clinical) consultations, education, training, meetings and other (family visits, equipment testing, demonstrations)

2. Estimate the percentage of telehealth sessions that would have required travel in the past and calculate, for each major category of use, the total cost if the user would have traveled. (percent of telehealth that replaced travel)



3. Apply an appropriate Valuation Factor to the potential savings for the percent of telehealth sessions that represent an expanded service. (In the past, people were less likely to travel for these types of sessions)

4. Vary key estimates in the model to see the effect on the result.

Sustainable Program (assumes all 24 communities are fully operational over 3 years)

Includes annual operational costs (connectivity, personnel, equipment upgrades and replacement, etc.)

Excludes major one time start up costs from the pilot project.

(a) Available utilization data were adjusted to 12 months and used to calculate per capita utilization rates for each First Nation community.

(b) Then per capita utilization rates of the First Nations communities with the longest running telehealth service were used to estimate total annual telehealth use for the entire network of 24 communities.

(c) Telehealth costs were calculated on an annual basis (12 months) for a sustainable network.

Theoretical Assumptions of the Economic Model

This economic evaluation used a cost-analysis approach based on Drummond et al. (1997). The societal viewpoint was assumed, focusing on monetary costs/savings to patients, educators/learners and meeting attendees in First Nations communities and government. This economic evaluation was based upon examination of the following monetary costs and savings.

Monetary Costs

** cost of a Sustainable Program (Telehealth Network costs)*
- costs of operating an established network, with some opportunity for growth and replacement of equipment.

Monetary Savings

** cost of averted travel (potential savings) (the main alternative to telehealth is to travel for services)*
-travel by patients to visit health care providers
-travel for education/training
-travel for administrative meetings
[travel costs include: transportation, accommodation, food and incidentals (parking, registration fees, etc.)]
** monetary value of "new" telehealth*
-this is the dollar value assigned to sessions that improve access to clinical, educational and other services. (see "Travel Module" for details)
-travel for education/training

Benefits that were <u>not</u> included

** lost wages due to travel (patients, escorts, providers or other users)*
** increase/decrease in patient health status, anxiety, quality of life, well-being, etc.*
** changes in productivity of patients, providers or other users*
** increase/decrease in risks associated with increase/decrease in travel (patients and learners)*
** delayed/timely intervention*
** re-direction to inappropriate/appropriate health care service*

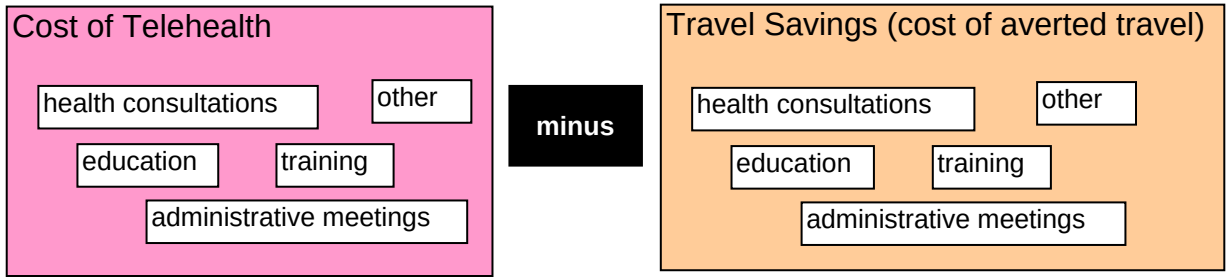
Limitations and Cautions

The **efficacy** and/or **effectiveness** of the telehealth service relative to the alternative service was not assessed. The assumption is that health care professionals/educators/administrators realize the limits of the technology and use and use the most appropriate modality, be it vidoeconferencing or travel.

The availability of telehealth varied as equipment became operational at different times in the communities and as services were added. Costs/savings also accrued at different times. The economic model deals with the sustainable program involving 24 First Nations communities.
The models estimated average annual costs/savings.
Sensitivity analyses were used to examine the effect of different values and assumptions on results.
Marginal and opportunity costs were not calculated.

Reference: Drummond, M. F., O'Brien, B., Stoddart, G. L. & Torrance, G. W. 1997. *Methods for the Economic Evaluation of Health Care Programmes.* 2nd Edition. Oxford University Press, Oxford, UK.

Model Format



The economic model consists of two main modules:

1. Cost of the Telehealth Network
2. Travel Savings (the cost of averted travel, or averted costs)

Each main module estimates costs/savings for sub-modules:
(a) health (clinical); (b) education; (c) training; (d) meetings; & (e) other
Model results are calculated for Telehealth Costs *minus* Travel Savings for each sub-module separately and for all sub-modules combined.

NOTES: The unit for comparison is the cost per event. The event is either a telehealth session or a return trip (defined below).

Telehealth session: may connect 2 or more sites and involve 2 or more people.
Usually 1 site provides the clinical service or educational session to the receiver site(s). For meetings, 1 site hosts the chair or organizer of the meeting and for modeling purposes is defined as the provider site. Other site(s) participating in the meeting are defined as the receiver site(s).

Telehealth costs are assigned to each session type (clinical, education, training, meeting and other) based on percentage utilization in a specified time period.

Return Trip: involves 1 or more people travelling to 1 or more locations and then back home.
Travel savings are estimated only for those people at the receiving site(s). In the past, the people at the receiving site(s) would have been most likely to travel. Exceptions to this rule are dealt with in the model by the changing the average savings due to averted travel, percent of travel averted, average number of people traveling, etc.

Module/Worksheet Colour Codes

lavender	Telehealth utilization data
rose	Telehealth module
tan	Travel module
light blue	Cost comparison

Variable Colour Codes

bright green	user input
light turquoise	data from another sheet
yellow	key output data

Telehealth Use by Type

Month-Year	Clinical Consults: Mean = 54 /month	Education: Mean = 24 /month	Training: Mean = 24 /month	Meetings: Mean = 17 /month	Other: Mean = 10 /month	TOTAL: Mean = 128 /month	Cancellations (not included): Mean = 24 /month
Apr-03	28	13	10	6	10	**67**	13
May-03	35	14	4	3	3	**59**	13
Jun-03	32	12	6	10	2	**62**	17
Jul-03	35	10	15	0	7	**67**	8
Aug-03	23	6	10	2	14	**55**	20
Sep-03	45	20	8	13	1	**87**	13
Oct-03	35	12	6	9	11	**73**	9
Nov-03	36	12	13	2	8	**71**	8
Dec-03	26	12	16	8	3	**65**	10
Jan-04	25	12	24	13	7	**81**	12
Feb-04	40	9	33	9	5	**96**	24
Mar-04	42	21	19	10	2	**94**	28
Apr-04	61	15	22	12	2	**112**	23
May-04	63	17	15	10	6	**111**	33
Jun-04	65	13	28	16	20	**142**	16
Jul-04	50	1	15	10	8	**84**	21
Aug-04	33	1	21	12	6	**73**	22
Sep-04	62	16	38	18	6	**140**	31
Oct-04	43	36	27	18	9	**133**	23
Nov-04	40	33	14	11	9	**107**	12
Dec-04	37	10	10	6	8	**71**	19
Jan-05	46	30	27	24	17	**144**	11
Feb-05	56	41	19	31	4	**151**	26
Mar-05	51	45	31	16	16	**159**	34
Apr-05	100	42	31	36	16	**225**	44
May-05	71	31	33	19	21	**175**	28
Jun-05	72	38	44	33	19	**206**	30
Jul-05	67	14	41	21	26	**169**	35
Aug-05	69	18	35	27	8	**157**	38
Sep-05	82	33	42	40	17	**214**	33
Oct-05	102	66	41	37	7	**253**	56
Nov-05	116	91	45	42	25	**319**	58
Dec-05	79	44	34	26	19	**202**	33

Month-Year	Clinical Consults: Mean = 54 /month	Education: Mean = 24 /month	Training: Mean = 24 /month	Meetings: Mean = 17 /month	Other: Mean = 10 /month	TOTAL: Mean = 128 /month	Cancellations (not included): Mean = 24 /month
Apr 03 to Dec 05							
Total use	1767	788	777	550	342	**4224**	801
number of months	33	33	33	33	33	**33**	33
percent	41.8%	18.7%	18.4%	13.0%	8.1%	**100.0%**	19.0%
							of 4224
annual use-prorated	643	287	283	200	124	**1536**	291
Mean	54	24	24	17	10	**128**	24
Median	46	16	22	13	8	**111**	23
Minimum	23	1	4	0	1	**55**	8
Maximum	116	91	45	42	26	**319**	58
Jan 05 to Dec 05							
Last 12	911	493	423	352	195	**2374**	426
percent	38.4%	20.8%	17.8%	14.8%	8.2%	**100.0%**	17.9%
							of 2374
Mean	76	41	35	29	16	**198**	36
Median	71.5	39.5	34.5	29	17	**188.5**	33.5
Minimum	46	14	19	16	4	**144**	11
Maximum	116	91	45	42	26	**319**	58

Comparison of % based on total time to % based on frequency of use

April 2003 to December 2005 (33 months)

Session Type	Total # of Sessions[1]	%	Total # of Scheduled Sessions[2]	%	Total time[3]	%	Average time (Duration in minutes)[4]	Number % - Time % (percentage points)
Clinical	1767	41.8%	1892	43.5%	61,817	26.7%	32.7	15.1
Education	788	18.7%	788	18.1%	82,075	35.5%	104.2	-35.3
Training	777	18.4%	777	17.9%	27,529	11.9%	35.4	6.5
Meetings	550	13.0%	550	12.6%	47,976	20.7%	87.2	-7.7
Other	342	8.1%	342	7.9%	12,081	5.2%	35.3	2.9
Total	**4,224**	**100.0%**	**4349**	**100.0%**	**231,478**	**100.0%**	**53.2**	

[1] Count includes multiple consultations for clinical telehealth sessions, but excludes no-shows (missed appointments)

[2] Count includes multiple consultations for clinical telehealth sessions and includes no-shows (missed appointments)

[3] Duration is the time originally scheduled for the telehealth sessions and includes no-shows (missed appointments) as well as appointments completed

[4] Average time is Total Time divided by Number of Scheduled Sessions.

Jan 2005 to Dec 2005 (last 12 months)

Session Type	Total # of Sessions[1]	%	Total # of Scheduled Sessions[2]	%	Total time[3]	Session Duration (%)	Average time (Duration in minutes)[4]	Number % - Time % (percentage points)
Clinical	911	38.4%	984	40.2%	31,627	23.9%	34.7	14.4
Education	493	20.8%	493	20.1%	52,950	40.1%	107.4	-19.3
Training	423	17.8%	423	17.3%	13,811	10.5%	32.7	7.4
Meetings	352	14.8%	352	14.4%	27,276	20.6%	77.5	-5.8
Other	195	8.2%	195	8.0%	6,487	4.9%	33.3	3.3
Total	**2,374**	**100.0%**	**2447**	**100.0%**	**132151**	**100.0%**	**55.7**	

[1-4] See notes in above table

Note: *Percentage use may differ slightly from that reported on previous tabs because sessions that were missing either duration or type were excluded from the above calculations.*

Telehealth Use by Community

Utilization	First Nation Communities of Expansion Project (See below for legend)											
Month-Year	**BL**	**BT**	**CL**	**DL**	**EB**	**FS**	**KF**	**KS**	**KW**	**LS**	**MD**	**MI**
Apr-03				10		6	2		11			
May-03				11		6	0		9			
Jun-03				9		6	2		9			
Jul-03				17		15	4		11			
Aug-03				9		9	1		6			
Sep-03				9		11	1		15			
Oct-03				13		6	0		4			
Nov-03				15		13	11		11			
Dec-03				14		7	0		6			
Jan-04				14		10	2		9			
Feb-04				22		9	4		21			
Mar-04				15		11	7		11			
Apr-04				40		8	8		15			
May-04				22		6	5		12			
Jun-04				25		14	17		7			
Jul-04		4		13		3	6		10			
Aug-04		3		7		0	5		6			
Sep-04		3		11		12	23		7			
Oct-04		8		9		9	17	10	8			
Nov-04	2	9		11		14	13	6	4			
Dec-04	0	4		9		11	8	8	11			1
Jan-05	0	11	2	21		15	14	9	18			19
Feb-05	0	9	7	28		23	17	22	20			21
Mar-05	0	14	18	28		14	30	25	21			17
Apr-05	0	13	18	32		26	29	15	27			20
May-05	1	15	20	27		20	24	2	19			23
Jun-05	1	14	21	26		23	24	15	12		2	28
Jul-05	11	6	13	17		17	25	21	11		13	19
Aug-05	6	9	8	26	3	28	14	15	25		15	23
Sep-05	16	19	12	24	16	21	20	24	15		10	21
Oct-05	18	16	25	25	20	19	21	23	16		12	26
Nov-05	23	23	17	27	24	33	39	17	31		22	22
Dec-05	15	13	11	12	14	19	17	18	12		9	14

Utilization	First Nation Communities of Expansion Project (See below for legend)												
Month-Year	**NB**	**NC**	**NK**	**NS**	**PH**	**PK**	**SC**	**SF**	**SL**	**WB**	**WP**	**WN**	**FN Total**
Apr-03				9	6						2	2	**48**
May-03				11	6						4	3	**50**
Jun-03				4	4						3	9	**46**
Jul-03				13	10				1		4	2	**77**
Aug-03				10	3				5		3	3	**49**
Sep-03				3	12				1		1	11	**64**
Oct-03				8	9				2		1	2	**45**
Nov-03				5	9				8		7	2	**81**
Dec-03				4	3				8		0	0	**42**
Jan-04				10	18				17		1	3	**84**
Feb-04				5	13				8		3	5	**90**
Mar-04				6	18				12		5	9	**94**
Apr-04				7	17				12		1	0	**108**
May-04				5	18				12		7	3	**90**
Jun-04				4	12				11		11	15	**116**
Jul-04		2		4	2				13		10	10	**77**
Aug-04		6		6	5				9		1	6	**54**
Sep-04		5		10	11				16		13	1	**112**
Oct-04		9		11	17				19		11	14	**142**
Nov-04		8		12	8				12		17	11	**127**
Dec-04		7		2	5				11		6	4	**87**
Jan-05		7		13	25				19	1	12	10	**196**
Feb-05		19		25	22				17	0	18	23	**271**
Mar-05		6		24	24				17	1	21	17	**277**
Apr-05		27	1	16	24				26	0	21	11	**306**
May-05		25	27	28	29				30	0	21	36	**347**
Jun-05	1	22	24	26	28	9		8	22	0	20	24	**350**
Jul-05	0	26	20	21	14	8	7	10	18	0	22	29	**328**
Aug-05	0	15	15	18	21	15	22	11	17	16	16	16	**354**
Sep-05	12	20	16	2	31	7	19	11	12	27	23	22	**400**
Oct-05	9	15	24	28	32	13	17	19	14	27	24	28	**471**
Nov-05	34	24	20	31	36	26	24	11	9	28	32	29	**582**
Dec-05	6	11	12	19	22	18	15	10	15	17	25	16	**340**

Utilization	Other Communities / Users								First Nations Community Use	
Month-Year	Balmertown or Red Lake	Sioux Lookout	Thunder Bay	Toronto	Winnipeg	All Other Communities	Other Total	*Grand Total*	# of FN Communities	Mean Use / FN Comm / Month
Apr-03	20	26	11	0	18	**16**	**91**	***139***	8	6.0
May-03	11	36	10	4	13	**8**	**82**	***132***	8	6.3
Jun-03	10	31	16	8	13	**11**	**89**	***135***	8	5.8
Jul-03	25	25	4	13	16	**7**	**90**	***167***	9	8.6
Aug-03	19	23	10	5	8	**4**	**69**	***118***	9	5.4
Sep-03	19	58	21	5	13	**18**	**134**	***198***	9	7.1
Oct-03	21	41	30	4	4	**9**	**109**	***154***	9	5.0
Nov-03	19	27	21	12	8	**4**	**91**	***172***	9	9.0
Dec-03	20	34	24	6	10	**7**	**101**	***143***	9	4.7
Jan-04	35	27	16	5	11	**12**	**106**	***190***	9	9.3
Feb-04	39	39	23	2	14	**11**	**128**	***218***	9	10.0
Mar-04	24	48	32	2	19	**9**	**134**	***228***	9	10.4
Apr-04	28	62	26	2	13	**14**	**145**	***253***	9	12.0
May-04	27	61	35	6	14	**12**	**155**	***245***	9	10.0
Jun-04	44	69	37	4	19	**18**	**191**	***307***	9	12.9
Jul-04	18	47	21	1	10	**8**	**105**	***182***	11	7.0
Aug-04	25	37	16	2	5	**8**	**93**	***147***	11	4.9
Sep-04	54	60	34	5	16	**23**	**192**	***304***	11	10.2
Oct-04	48	69	38	12	7	**18**	**192**	***334***	12	11.8
Nov-04	33	60	37	7	14	**11**	**162**	***289***	13	9.8
Dec-04	23	27	18	4	19	**3**	**94**	***181***	14	6.2
Jan-05	61	61	26	4	17	**24**	**193**	***389***	16	12.3
Feb-05	47	89	44	6	18	**31**	**235**	***506***	16	16.9
Mar-05	71	72	25	6	16	**22**	**212**	***489***	16	17.3
Apr-05	80	119	53	18	23	**22**	**315**	***621***	17	18.0
May-05	63	69	29	5	27	**19**	**212**	***559***	17	20.4
Jun-05	73	93	31	3	23	**29**	**252**	***602***	21	16.7
Jul-05	71	61	31	5	9	**11**	**188**	***516***	22	14.9
Aug-05	63	61	26	6	17	**17**	**190**	***544***	23	15.4
Sep-05	80	81	36	13	28	**35**	**273**	***673***	23	17.4
Oct-05	67	127	42	11	26	**48**	**321**	***792***	23	20.5
Nov-05	85	162	58	19	25	**69**	**418**	***1000***	23	25.3
Dec-05	57	92	46	14	12	**37**	**258**	***598***	23	14.8

	BL	BT	CL	DL	EB	FS	KF	KS	KW	LS	MD	MI
Apr 03 to Dec 05												
Total	93	193	172	598	77	444	410	230	430	0	83	254
% Grand total	0.8%	1.7%	1.5%	5.2%	0.7%	3.9%	3.6%	2.0%	3.7%		0.7%	2.2%
# Months	14	18	12	33	5	33	33	15	33	0	7	13
Annual usage	80	129	172	217	185	161	149	184	156		142	234
Jan 05 to Dec 05												
Total-last 12 months	91	162	172	293	77	258	274	206	227		83	253
% Grand total	1.2%	2.2%	2.4%	4.0%	1.1%	3.5%	3.8%	2.8%	3.1%		1.1%	3.5%
# Months	12	12	12	12	5	12	12	12	12	0	7	12
Annual usage	91	162	172	293	184.8	258	274	206	227		142.2857	253

Population used for rate	BL	BT	CL	DL	EB	FS	KF	KS	KW	LS	MD	MI
DIAND-Registered Indians on reserve+crown land-2004	499	889	481	838	1159	477	414	737	439	824	197	959

Annual per capita use	BL	BT	CL	DL	EB	FS	KF	KS	KW	LS	MD	MI
Rate from beginning	0.160	0.145	0.358	0.259	0.159	0.338	0.360	0.250	0.356	not	0.722	0.244
number of months	14	18	12	33	5	33	33	15	33	included	7	13
Rate from last 12 months	0.182	0.182	0.358	0.350	0.159	0.541	0.662	0.280	0.517		0.722	0.264
number of months	12	12	12	12	5	12	12	12	12		7	12

	NB	NC	NK	NS	PH	PK	SC	SF	SL	WB	WP	WN	FN Total
Apr 03 to Dec 05													
Total	62	254	159	400	514	96	104	80	393	117	366	376	**5905**
% Grand total	0.5%	2.2%	1.4%	3.5%	4.5%	0.8%	0.9%	0.7%	3.4%	1.0%	3.2%	3.3%	51.2%
# Months	7	18	9	33	33	7	6	7	30	12	33	33	of 11525
Annual usage	106	169	212	145	187	165	208	137	157	117	133	137	**3684**
Jan 05 to Dec 05													
Total-last 12 months	62	217	159	251	308	96	104	80	216	117	255	261	**4222**
% Grand total	0.9%	3.0%	2.2%	3.4%	4.2%	1.3%	1.4%	1.1%	3.0%	1.6%	3.5%	3.6%	57.9%
# Months	7	12	9	12	12	7	6	7	12	12	12	12	of 7289
Annual usage	106.2857	217	212	251	308	164.5714	208	137.1429	216	117	255	261	**4716**

Population used for rate	NB	NC	NK	NS	PH	PK	SC	SF	SL	WB	WP	WN	FN Total
DIAND-Registered Indians on reserve+crown land-2004	327	702	277	398	396	1907	459	153	1961	622	359	483	*15,957*
												n=	*24*
Annual per capita use	NB	NC	NK	NS	PH	PK	SC	SF	SL	WB	WP	WN	
Rate from beginning	0.325	0.241	0.765	0.365	0.472	0.086	0.453	0.896	0.080	0.188	0.371	0.283	*Adjusted to 12*
number of months	7	18	9	33	33	7	6	7	30	12	33	33	*months*
Rate from last 12 months	0.325	0.309	0.765	0.631	0.778	0.086	0.453	0.896	0.110	0.188	0.710	0.540	*Adjusted to 12*
number of months	7	12	9	12	12	7	6	7	12	12	12	12	*months*

	Balmertown or Red Lake	Sioux Lookout	Thunder Bay	Toronto	Winnipeg	All Other Communities	Other Total	*Grand Total*
Apr 03 to Dec 05								
Total	1380	1994	927	219	505	595	**5620**	**11525**
% Grand total	12.0%	17.3%	8.0%	1.9%	4.4%	5.2%	48.8%	**100.0%**
# Months	33	33	33	33	33	33	*of 11525*	
Annual usage	502	725	337	80	184	216	*2044*	**5728**
Jan 05 to Dec 05								
Total-last 12 months	818	1087	447	110	241	364	**3067**	**7289**
% Grand total	11.2%	14.9%	6.1%	1.5%	3.3%	5.0%	42.1%	**100.0%**
# Months	12	12	12	12	12	12	*of 7289*	
Annual usage	818	1087	447	110	241	364	**3067**	**7783**

Population used for rate
DIAND-Registered Indians on reserve+crown land-2004

Annual per capita use
Rate from beginning
number of months
Rate from last 12 months
number of months

Annual Per Capita Telehealth Utilization Rates								
Population (All communities)	**15,957**							
	Full period of 33 months				Last 12 months			
	Longest Running		All Communities		Longest Running		All Communities	
N=	9	9	23	23	9	9	23	23
	Rate	# Months	Rate	# Months	Rate	# Months	Rate	# Months
Average	0.321	32.7	0.343	19.3	0.538	12.0	0.435	10.4
Median	0.356	33.0	0.325	15.0	0.541	12.0	0.358	12.0
Low	0.080	30.0	0.080	5.0	0.110	12.0	0.086	5.0
High	0.472	33.0	0.896	33.0	0.778	12.0	0.896	12.0
Total Use	1444		3684		2343		4716	
Total Pop	5765		15133		5765		15133	
= Ratio	0.250		0.243		0.406		0.312	
Estimated Use	**#Sessions**		**#Sessions**		**#Sessions**		**#Sessions**	
Average	5116		5466		8579		6944	
Median	5684		5187		8631		5706	
Low	1279		1279		1758		1377	
High	7532		14303		12411		14303	
Ratio	3996		3885		6485		4973	

Summary of Use for Full Period of 33 Months		
	# of Communities	Average Use / Community / Month
Mean	13.5	11.6
Median	12.5	10.2
Min	8.0	4.7
Max	23.0	25.3
Std Dev	5.5	5.3

Usage by Type vs. Usage by	
Last 33 months	
sum of TH sessions in all FN cor	5905
sum of TH sessions for all types	4224
ratio =	1.398
Last 12 months	
sum of TH sessions in all FN cor	4222
sum of TH sessions for all types	2374
ratio =	1.778

# FN community use per session	
Last 12 months	
Clinical	0.77
Education	2.82
Training	1.45
Meetings	3.64
Other	1.19
Overall	1.78

First Nation Community of Expansion Project
BL-Bearskin Lake
BT-Big Trout Lake-Kitchenuhmaykoosib Inninuwug
CL-Cat lake
DL-Deer Lake
EB-Eabametoong-Fort Hope
FS-Fort Severn
KF-Kingfisher
KS-Kasabonika
KW-Keewaywin
LS-Lac Seul
MD-Muskrat Dam
MI-Mishkeegogamang-New Osnaburgh
NB-Nibinamik-Summer Beaver
NC-North Caribou-Weagamow Lake
NK-Neskantaga-Lansdowne House
NS-North Spirit Lake
PH-Poplar Hill
PK-Pikangikum
SC-Sachigo Lake
SF-Slate Falls
SL-Sandy Lake
WB-Webequie
WN-Wunnumin
WP-Wapekeka-Angling Lake
First Nation community with long running telehealth service are shaded.

Service or Administration Centres or Other Communities
Balmertown or Red Lake
Sioux Lookout
Thunder Bay
Toronto
Winnipeg
All Other Communities

Telehealth Use by Community & Type

23 FN communities (excludes Lac Seul) all 33 months											
Community	**Clinical**	**%**	**Education**	**%**	**Training**	**%**	**Meeting**	**%**	**Other**	**%**	**Total**
Bearskin Lake	21	22.6%	15	16.1%	21	22.6%	30	32.3%	6	6.5%	**93**
Big Trout Lake	39	20.2%	61	31.6%	19	9.8%	66	34.2%	8	4.1%	**193**
Cat Lake	26	15.1%	60	34.9%	20	11.6%	54	31.4%	12	7.0%	**172**
Deer Lake	229	38.3%	135	22.6%	73	12.2%	106	17.7%	55	9.2%	**598**
Eabametoong	20	26.0%	13	16.9%	15	19.5%	25	32.5%	4	5.2%	**77**
Fort Severn	74	16.7%	180	40.5%	74	16.7%	88	19.8%	28	6.3%	**444**
Kasabonika	34	14.8%	78	33.9%	55	23.9%	53	23.0%	10	4.3%	**230**
Keewaywin	82	19.1%	156	36.3%	94	21.9%	60	14.0%	38	8.8%	**430**
Kingfisher	71	17.3%	123	30.0%	101	24.6%	86	21.0%	29	7.1%	**410**
Mishkeegogamang	29	11.4%	61	24.0%	63	24.8%	85	33.5%	16	6.3%	**254**
Muskrat Dam	11	13.3%	32	38.6%	12	14.5%	26	31.3%	2	2.4%	**83**
Neskantaga	10	6.3%	69	43.4%	33	20.8%	35	22.0%	12	7.5%	**159**
Nibinamik	6	9.7%	17	27.4%	8	12.9%	29	46.8%	2	3.2%	**62**
North Caribou	53	20.9%	66	26.0%	36	14.2%	70	27.6%	29	11.4%	**254**
North Spirit Lake	97	24.3%	116	29.0%	50	12.5%	96	24.0%	41	10.3%	**400**
Pikangikum	7	7.3%	32	33.3%	16	16.7%	35	36.5%	6	6.3%	**96**
Poplar Hill	123	23.9%	143	27.8%	116	22.6%	106	20.6%	26	5.1%	**514**
Sachigo Lake	14	13.5%	37	35.6%	17	16.3%	32	30.8%	4	3.8%	**104**
Sandy Lake	118	30.0%	66	16.8%	81	20.6%	87	22.1%	41	10.4%	**393**
Slate Falls	10	12.5%	26	32.5%	14	17.5%	27	33.8%	3	3.8%	**80**
Webequie	19	16.2%	41	35.0%	17	14.5%	31	26.5%	9	7.7%	**117**
Wapekeka	91	24.9%	93	25.4%	56	15.3%	103	28.1%	23	6.3%	**366**
Wunnumin	86	22.9%	95	25.3%	82	21.8%	89	23.7%	24	6.4%	**376**
Total	**1270**	**21.5%**	**1715**	**29.0%**	**1073**	**18.2%**	**1419**	**24.0%**	**428**	**7.2%**	**5905**
mean	55	18.6%	75	29.7%	47	17.7%	62	27.5%	19	6.5%	**257**
median	34	17.3%	66	30.0%	36	16.7%	60	27.6%	12	6.3%	**230**
min	6	6.3%	13	16.1%	8	9.8%	25	14.0%	2	2.4%	**62**
max	229	38.3%	180	43.4%	116	24.8%	106	46.8%	55	11.4%	**598**
count	23	23	23	23	23	23	23	23	23	23	**23**

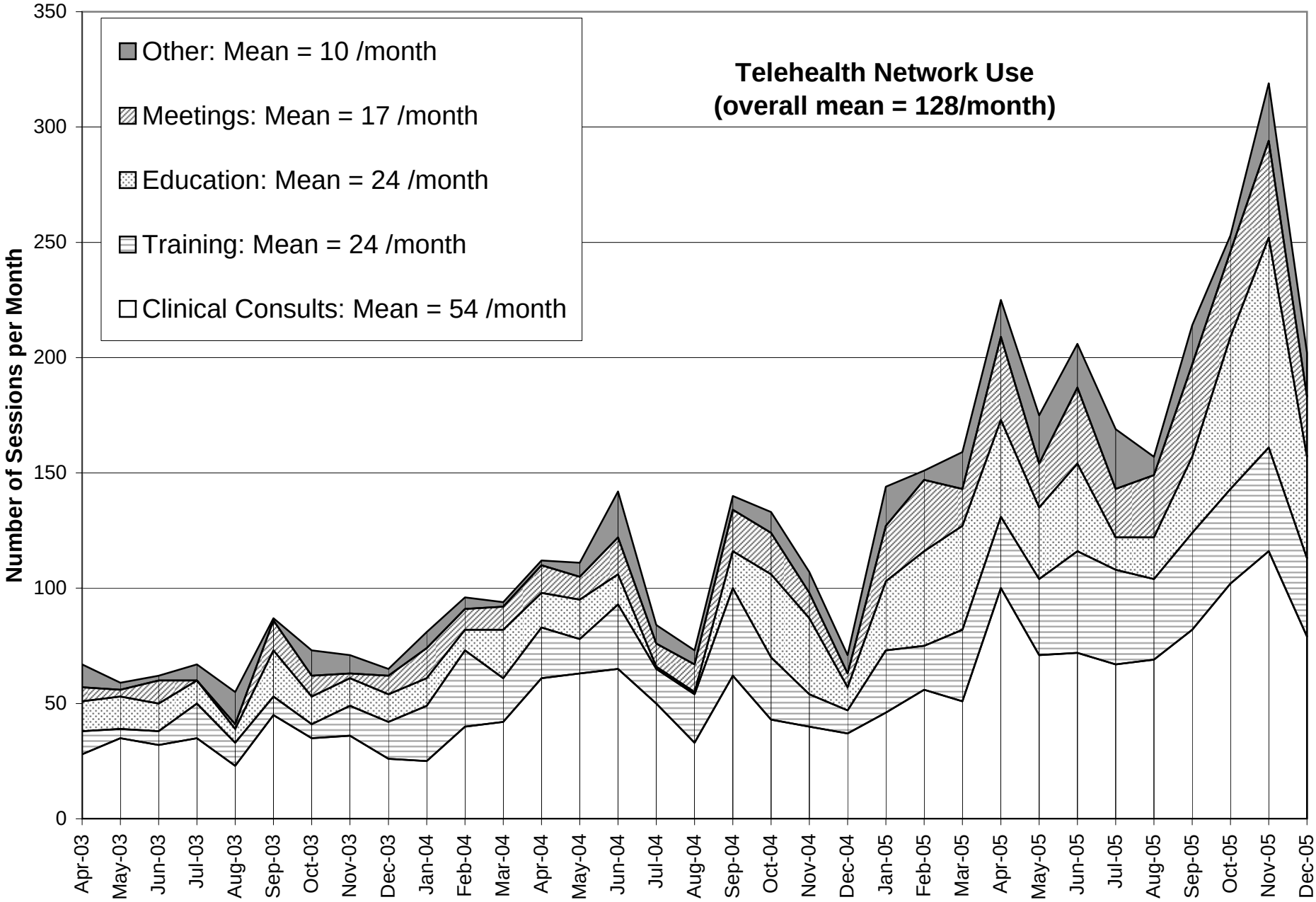
23 FN communities (excludes Lac Seul) Last 12 months											
Community	**Clinical**	**%**	**Education**	**%**	**Training**	**%**	**Meeting**	**%**	**Other**	**%**	**Total**
Bearskin Lake	21	23.1%	14	15.4%	21	23.1%	30	33.0%	5	5.5%	**91**
Big Trout Lake	37	22.8%	55	34.0%	8	4.9%	59	36.4%	3	1.9%	**162**
Cat Lake	26	15.1%	60	34.9%	20	11.6%	54	31.4%	12	7.0%	**172**
Deer Lake	66	22.5%	90	30.7%	20	6.8%	94	32.1%	23	7.8%	**293**
Eabametoong	20	26.0%	13	16.9%	15	19.5%	25	32.5%	4	5.2%	**77**
Fort Severn	26	10.1%	123	47.7%	29	11.2%	71	27.5%	9	3.5%	**258**
Kasabonika	26	12.6%	74	35.9%	48	23.3%	52	25.2%	6	2.9%	**206**
Keewaywin	25	11.0%	115	50.7%	26	11.5%	49	21.6%	12	5.3%	**227**
Kingfisher	32	11.7%	97	35.4%	54	19.7%	72	26.3%	19	6.9%	**274**
Mishkeegogamang	29	11.5%	61	24.1%	63	24.9%	84	33.2%	16	6.3%	**253**
Muskrat Dam	11	13.3%	32	38.6%	12	14.5%	26	31.3%	2	2.4%	**83**
Neskantaga	10	6.3%	69	43.4%	33	20.8%	35	22.0%	12	7.5%	**159**
Nibinamik	6	9.7%	17	27.4%	8	12.9%	29	46.8%	2	3.2%	**62**
North Caribou	48	22.1%	60	27.6%	26	12.0%	63	29.0%	20	9.2%	**217**
North Spirit Lake	40	15.9%	93	37.1%	18	7.2%	79	31.5%	21	8.4%	**251**
Pikangikum	7	7.3%	32	33.3%	16	16.7%	35	36.5%	6	6.3%	**96**
Poplar Hill	63	20.5%	113	36.7%	34	11.0%	91	29.5%	7	2.3%	**308**
Sachigo Lake	14	13.5%	37	35.6%	17	16.3%	32	30.8%	4	3.8%	**104**
Sandy Lake	70	32.4%	37	17.1%	20	9.3%	74	34.3%	15	6.9%	**216**
Slate Falls	10	12.5%	26	32.5%	14	17.5%	27	33.8%	3	3.8%	**80**
Webequie	19	16.2%	41	35.0%	17	14.5%	31	26.5%	9	7.7%	**117**
Wapekeka	54	21.2%	69	27.1%	33	12.9%	91	35.7%	8	3.1%	**255**
Wunnumin	44	16.9%	64	24.5%	61	23.4%	79	30.3%	13	5.0%	**261**
Total	**704**	**16.7%**	**1392**	**33.0%**	**613**	**14.5%**	**1282**	**30.4%**	**231**	**5.5%**	**4222**
mean	31	16.3%	61	32.2%	27	15.0%	56	31.2%	10	5.3%	**184**
median	26	15.1%	60	34.0%	20	14.5%	54	31.4%	9	5.3%	**206**
min	6	6.3%	13	15.4%	8	4.9%	25	21.6%	2	1.9%	**62**
max	70	32.4%	123	50.7%	63	24.9%	94	46.8%	23	9.2%	**308**
count	23	23	23	23	23	23	23	23	23	23	**23**

5 Main Sites all 33 months											
Community	**Clinical**	**%**	**Education**	**%**	**Training**	**%**	**Meeting**	**%**	**Other**	**%**	**Total**
Thunder Bay	568	61.3%	261	28.2%	2	0.2%	62	6.7%	34	3.7%	**927**
Toronto	120	54.8%	77	35.2%	2	0.9%	12	5.5%	8	3.7%	**219**
Winnipeg	376	74.5%	97	19.2%	9	1.8%	13	2.6%	10	2.0%	**505**
Sioux Lookout	1096	55.0%	540	27.1%	12	0.6%	310	15.5%	36	1.8%	**1994**
Balmertown / Red Lake	103	7.5%	266	19.3%	516	37.4%	288	20.9%	207	15.0%	**1380**
Total	**2263**	**45.0%**	**1241**	**24.7%**	**541**	**10.8%**	**685**	**13.6%**	**295**	**5.9%**	**5025**
mean	453	50.6%	248	25.8%	108	8.2%	137	10.2%	59	5.2%	**1005**
median	376	55.0%	261	27.1%	9	0.9%	62	6.7%	34	3.7%	**927**
min	103	7.5%	77	19.2%	2	0.2%	12	2.6%	8	1.8%	**219**
max	1096	74.5%	540	35.2%	516	37.4%	310	20.9%	207	15.0%	**1994**
count	5	5	5	5	5	5	5	5	5	5	**5**

9 First FN communities With The Longest Running Telehealth Service - all 33 months											
Community	**Clinical**	**%**	**Education**	**%**	**Training**	**%**	**Meeting**	**%**	**Other**	**%**	**Total**
Deer Lake	229	38.3%	135	22.6%	73	12.2%	106	17.7%	55	9.2%	**598**
Fort Severn	74	16.7%	180	40.5%	74	16.7%	88	19.8%	28	6.3%	**444**
Kingfisher	71	17.3%	123	30.0%	101	24.6%	86	21.0%	29	7.1%	**410**
Keewaywin	82	19.1%	156	36.3%	94	21.9%	60	14.0%	38	8.8%	**430**
North Spirit	97	24.3%	116	29.0%	50	12.5%	96	24.0%	41	10.3%	**400**
Poplar Hill	123	23.9%	143	27.8%	116	22.6%	106	20.6%	26	5.1%	**514**
Sandy Lake	118	30.0%	66	16.8%	81	20.6%	87	22.1%	41	10.4%	**393**
Wapekeka	91	24.9%	93	25.4%	56	15.3%	103	28.1%	23	6.3%	**366**
Wunnumin	86	22.9%	95	25.3%	82	21.8%	89	23.7%	24	6.4%	**376**
Total	**971**	**24.7%**	**1107**	**28.2%**	**727**	**18.5%**	**821**	**20.9%**	**305**	**7.8%**	**3931**
mean	108	24.1%	123	28.2%	81	18.7%	91	21.2%	34	7.8%	**437**
median	91	23.9%	123	27.8%	81	20.6%	89	21.0%	29	7.1%	**410**
min	71	16.7%	66	16.8%	50	12.2%	60	14.0%	23	5.1%	**366**
max	229	38.3%	180	40.5%	116	24.6%	106	28.1%	55	10.4%	**598**
count	9	9	9	9	9	9	9	9	9	9	**9**

5 Main Sites Last 12 months											
Community	**Clinical**	**%**	**Education**	**%**	**Training**	**%**	**Meeting**	**%**	**Other**	**%**	**Total**
Thunder Bay	278	62.2%	127	28.4%	1	0.2%	33	7.4%	8	1.8%	**447**
Toronto	74	67.3%	36	32.7%	0	0.0%	0	0.0%	0	0.0%	**110**
Winnipeg	162	67.2%	63	26.1%	5	2.1%	6	2.5%	5	2.1%	**241**
Sioux Lookout	563	51.8%	329	30.3%	4	0.4%	165	15.2%	26	2.4%	**1087**
Balmertown / Red Lake	45	5.5%	196	24.0%	234	28.6%	230	28.1%	113	13.8%	**818**
Total	**1122**	**41.5%**	**751**	**27.8%**	**244**	**9.0%**	**434**	**16.1%**	**152**	**5.6%**	**2703**
mean	224	50.8%	150	28.3%	49	6.3%	87	10.6%	30	4.0%	**541**
median	162	62.2%	127	28.4%	4	0.4%	33	7.4%	8	2.1%	**447**
min	45	5.5%	36	24.0%	0	0.0%	0	0.0%	0	0.0%	**110**
max	563	67.3%	329	32.7%	234	28.6%	230	28.1%	113	13.8%	**1087**
count	5	5	5	5	5	5	5	5	5	5	**5**

9 First FN communities With The Longest Running Telehealth Service - last 12 months											
Community	**Clinical**	**%**	**Education**	**%**	**Training**	**%**	**Meeting**	**%**	**Other**	**%**	**Total**
Deer Lake	66	22.5%	90	30.7%	20	6.8%	94	32.1%	23	7.8%	**293**
Fort Severn	26	10.1%	123	47.7%	29	11.2%	71	27.5%	9	3.5%	**258**
Kingfisher	32	11.7%	97	35.4%	54	19.7%	72	26.3%	19	6.9%	**274**
Keewaywin	25	11.0%	115	50.7%	26	11.5%	49	21.6%	12	5.3%	**227**
North Spirit	40	15.9%	93	37.1%	18	7.2%	79	31.5%	21	8.4%	**251**
Poplar Hill	63	20.5%	113	36.7%	34	11.0%	91	29.5%	7	2.3%	**308**
Sandy Lake	70	32.4%	37	17.1%	20	9.3%	74	34.3%	15	6.9%	**216**
Wapekeka	54	21.2%	69	27.1%	33	12.9%	91	35.7%	8	3.1%	**255**
Wunnumin	44	16.9%	64	24.5%	61	23.4%	79	30.3%	13	5.0%	**261**
Total	**420**	**17.9%**	**801**	**34.2%**	**295**	**12.6%**	**700**	**29.9%**	**127**	**5.4%**	**2343**
mean	47	18.0%	89	34.1%	33	12.6%	78	29.9%	14	5.5%	**260**
median	44	16.9%	93	35.4%	29	11.2%	79	30.3%	13	5.3%	**258**
min	25	10.1%	37	17.1%	18	6.8%	49	21.6%	7	2.3%	**216**
max	70	32.4%	123	50.7%	61	23.4%	94	35.7%	23	8.4%	**308**
count	9	9	9	9	9	9	9	9	9	9	**9**


Telehealth Network Use
(overall mean = 128/month)
Other: Mean = 10 /month
Meetings: Mean = 17 /month
Education: Mean = 24 /month
Training: Mean = 24 /month
Clinical Consults: Mean = 54 /month
Number of Sessions per Month
350
300
250
200
150
100
50
0
Apr-03
May-03
Jun-03
Jul-03
Aug-03
Sep-03
Oct-03
Nov-03
Dec-03
Jan-04
Feb-04
Mar-04
Apr-04
May-04
Jun-04
Jul-04
Aug-04
Sep-04
Oct-04
Nov-04
Dec-04
Jan-05
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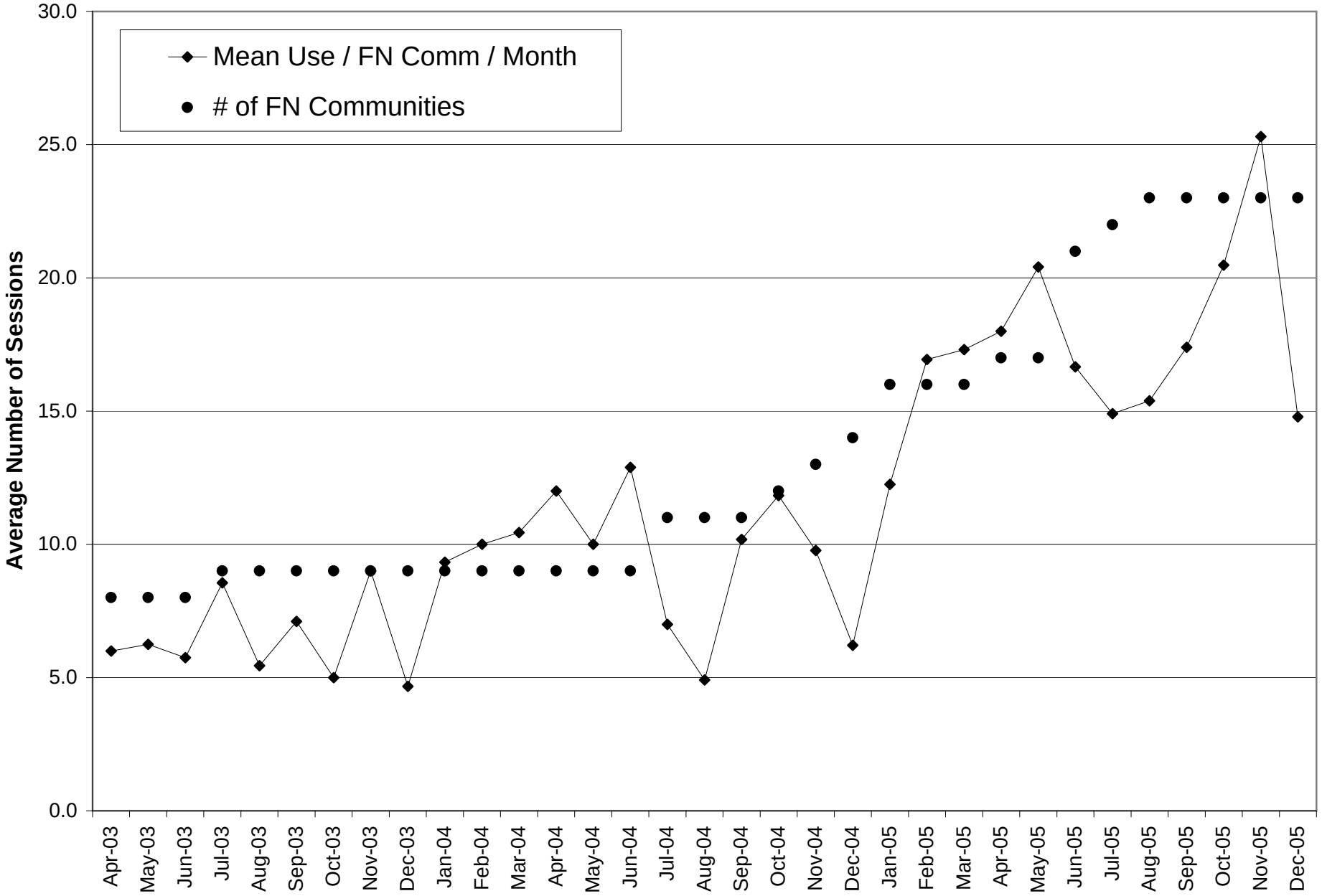
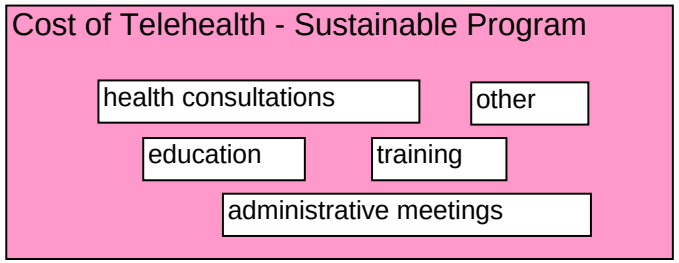
Jul-05
Aug-05
Sep-05
Oct-05
Nov-05
Dec-05


Mean Use / FN Comm / Month
# of FN Communities
Average Number of Sessions
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Apr-03
May-03
Jun-03
Jul-03
Aug-03
Sep-03
Oct-03
Nov-03
Dec-03
Jan-04
Feb-04
Mar-04
Apr-04
May-04
Jun-04
Jul-04
Aug-04
Sep-04
Oct-04
Nov-04
Dec-04
Jan-05
Feb-05
Mar-05
Apr-05
May-05
Jun-05
Jul-05
Aug-05
Sep-05
Oct-05
Nov-05
Dec-05

Telehealth Module-Costs



Costs

* Cost of a Sustainable Program -- actual cost of communications, personnel, minor equipment upgrades or purchase, etc.
* Excludes major capital start-up costs.

SOURCE: service providers (KOTH, K-net); telecom companies; equipment venders; etc.

Annuitization of Telehealth Capital

Sustainable Program **3 years (36 months)**

Model Assumptions

ID	Cost Item	Specifics	Unit Price				
Cost-03a		Amortization (interest) rate	0.01%	change this value	.0001 to .05 (0.01 to 5%)		
Cost-03b	**Sustainable Program**	Amortization period (months)	36	change this value	Annuitizing factor	0.333	based on rate and number of years
				Standard formula for annuitization of capital expenditures.			See, for example, page 70 in Drummond, et al. 1990.
	Cost Sensitivity Factor	default=1.00	1.00	change this value	0.8=20% lower costs 1.2=20% higher costs		
	Savings Sensitivity Factor	default=1.00	1.00	change this value	0.8=20% lower savings 1.2=20% higher savings		

ID theme and number are from Evaluation Framework.

Sustainable Program Cost for the Telehealth Network

3 years (36 months)

Costs = DESIGN (estimated purchases and expenses) — Sustainable

ID	Cost Item	Specifics	Unit Price	Quantity	Total Cost
Equipment Costs (Capital)					
Cost-01a	Telehealth platforms, Peripherals and medical devices, Computers, monitors, etc., Cables, Software, includes warranties	First Nations Communities	$56,250	3	$168,750
Cost-01b		Red Lake, Sioux Lookout	$56,250	0	$0
Cost-01c		Thunder Bay, Winnipeg	$56,250	0	$0
Cost-01e	Installation (or purchase) of land line (or microwave towers) and associated costs	network cabling for nursing stations and connectivity	$630,000	0	$0
Cost-01f	Satellite earth stations and related costs	included?	??		$0
Cost-02a	Shipping & handling, Installation	included?	??		$0
Cost-05a	Construction/ renovation, Office furnishings	FedNor-Furn & Equip -Additional	$415,207	0	$0
	Other equipment	network routers (RL, SL) (TB, Win. In-kind)	$35,000	1	$35,000
	Other equipment	community routers & switches	$2,200	3	$6,600
	Other equipment	large screen video conference units	$26,000	1	$26,000
Cost-02b	Warranty/ maintenance/ insurance	10% of "other" equipment costs/year			$6,760
	Taxes	included			$0
	Data Source: KOTH sustainability & pilot project budgets			*9% of annual cost*	$243,110

Sustainable

ID	Cost Item	Specifics	Unit Price	Quantity	Total Cost
Equipment Costs (Annual)					
Cost-04a	Access and line charges (hook-up included above with installation)	$1200/month/site =$14,400/year	$14,400	24	$345,600
Cost-04b	Other access charges	$48,000/y SSHA network interface-ISDN/bridging	$48,000	1	$48,000
Cost-04b	Other access charges	$90,000/y K-net	$90,000	1	$90,000
Cost-05b	Building operations, Room rental	included in admin overhead	??		$0
Cost-08	Overhead	included in admin overhead	??		$0
	Data Source: KOTH sustainability budget			*17% of annual cost*	$483,600

				Sustainable	
ID	**Cost Item**	**Specifics**	**Unit Price**	**Quantity**	**Total Cost**
Other Costs (Annual)					
Cost-09	Promotion/ marketing		$35,000	1	$35,000
Cost-07a	Training/ education	Staff development and special projects support	$27,000	1	$27,000
Cost-07b	Project travel		$38,250	1	$38,250
Cost-07c	Project management		$36,667	1	$36,667
	Data Source: KOTH sustainability budget			*5% of annual cost*	$136,917
				Sustainable	
ID	**Cost Item**	**Specifics**	**Unit Price**	**Quantity**	**Total Cost**
Personnel Costs (Annual)					
Cost-06a	Salary + benefits (13.5%)	CTCs	$34,050	24	$817,200
Cost-06b	Salary + benefits (13.5%)	KOTH personnel K-net personnel	$902,325	1	$902,325
	Administrative overhead (15%)	15% of base salary for both KOTH personnel and CTCs	$227,250	1	$227,250
	Data Source: KOTH sustainability budget			*69% of annual cost*	$1,946,775
					$2,810,402

Annual Telehealth Network costs approportioned by frequency of type of use

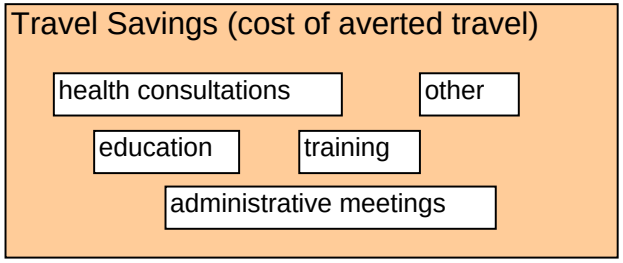
Sustainable Program

Type of Use	Frequency of Use (%)	Source of Cost Estimate Design
Clinical	38%	$1,078,465
Education	21%	$583,626
Training	18%	$500,758
Meetings	15%	$416,707
Other	8%	$230,846
Total	100%	$2,810,402

Values are adjusted here by a cost sensitivity factor.

Cost Sensitivity Factor	1.00

Travel Module-Averted Costs (Savings)



Averted Costs or Savings

Health Consultations Travel Sub-Module

* Cost of travel by patients and escorts (accompanying persons) to visit health care providers

**Schedevacs (scheduled medically necessary travel)

SOURCE: Health Canada, FNIHB, NIHB (need Band Council Resolutions to authorize release).

**Medevacs (emergency/unscheduled medically necessary travel)

SOURCE: Ontario Ministry of Health and Long-Term Care (need BCRs to authorize release).

Education/Training Travel Sub-Module

* Cost of travel for health education/training

SOURCE: KOTH, (Health Canada)

Administrative Meetings Travel Sub-Module

* Cost of travel for administrative meetings

SOURCE: KOTH, (Health Canada)

NOTES: (a) travel included transportation, accommodation, food and incidentals (registration, parking, supplies, etc.)
(b) travel costs were estimated from: (i) administrative/accounting values; or (ii) commercial air fares, hotel charges or hospital per diem, food and incidental per diem, registration fees, etc.

Cost Estimates

$8,000	medevac from Fort Severn (p 14 in Canada Connects magazine, Spring 2004) OHIP.
$5,000	medevac cost mentioned in "Turning the corner" video; reiterated by Dr. Dermot McLoughlin in same video -OHIP
$12,000	medevac cost mentioned in "Turning the corner" video -OHIP
$3,875	Average Air Ambulance Ontario billing for standard agreement operators (April - December 2003). Decreased to $2101 by a January 2005 policy. Source: Office of the Auditor General, 2005. Chapter 3 Section 3.01 Ambulance Service - Air).
$7,503	Average Air Ambulance Ontario billing for critical care and preferred provider operators (April - December 2003). Decreased to $3057 by a January 2004 policy. Source: Office of the Auditor General, 2005. Chapter 3 Section 3.01 Ambulance Service - Air).
1,530	Number of air ambulance transfers from 20 First Nations communities in Sioux Lookout Zone in fiscal year 2004/2005. Source: Ontario Air Ambulance Services Corporation.
16,827	Number of approved medical specialist consultations requiring travel in fiscal year 2002/2003. Source: NIHB Program data reported in PHCTF.
3,097	Number of medevacs in fiscal year 2002/2003. Source: NIHB program data reported in PHCTF Application of KOTH/NORTH Network Expansion Plan, May 2003.
$5,700	Air ambulance, Nova Scotia. Source: Institute of Health Economics (IHE). 2002. A National List of Provincial Costs for Healthcare: Canada 1997/8, Edmonton, AB.
$3,000	Air ambulance, Alberta. Source: IHE 2002.

Caveat: Non-Insured Health Benefit data are typically recorded for each passenger and for each leg of the trip. Multiple records may exist for a given trip to correspond to different reimbursement categories. Therefore averages may underestimate the actual cost of a patient (+/- escort) who leaves the community for medical care.

$1,200	schedevac from Fort Severn (p 14 in Canada Connects magazine, Spring 2004) NIHB
$1,250	average cost NIHB (John Rowlandson, personal communication, June 21, 2005, based on 7.25 trips/ site, 25 sites $2.72M/year)
$628	average cost (per patient or per passenger?) (per leg?) NIHB (PHCTF application, John Rowlandson, based on $12,504,561 for 19,924 trips in Fiscal Year 2002 / 2003)
$2,716	Total cost of schedevac from Popular Hill to Sioux Lookout - patient and escort for 3 days. Source: Keresztes et al. 2002. Evaluation of the Keewaytinook Okimakanak Telepsychiatry Pilot Project. Includes psychiatrist's wages ($200) and overhead ($145).
$4,077	Total cost of schedevac from Popular Hill to Sioux Lookout - patient and escort for 5 days. Source: Keresztes et al. 2002. Evaluation of the Keewaytinook Okimakanak Telepsychiatry Pilot Project. Includes counsellor's wages ($600) and overhead ($580).

Not all Travel Costs are Savings

Some telehealth sessions will replace travel and some will be in addition to what would have occurred in the past.

Telehealth sessions will avert a trip for those situations that would have required a trip in the past (or would have required a trip in a community without telehealth). For these averted trips it is valid to compare the full cost of telehealth to the full cost of travel (averted travel cost = savings).

Percentage averted was estimated for the major types of telehealth sessions.
However, we know that not all telehealth sessions will avert a trip that would have occurred in the past. This is because telehealth, relative to travel, may be more convenient in time and dollars to the patient and other users. Total use may be higher because of

Thus some of these telehealth sessions are in addition to what would have occurred in the past and, from an economic point of view, these additional telehealth sessions have lower value. This is because community members, band councils, charitable organizations, government agencies, etc., did not place the same monetary value on these sessions in the past. For these additional or "new" sessions, the full cost of telehealth is compared against an adjusted cost of travel, to reflect the historically lower value placed on travel for this type of session.
"New" telehealth, however, may have a future monetary value if, for example, improved access to health, education and social services leads to improved quality of life and a higher standard of living. These additional benefits can be explored in the model by changing the monetary value of "new" telehealth from the lower default settings to settings that reflect the potential monetary benefits.

The **Valuation Factor** is the % of the travel cost that is assumed to represent a real savings.
It is set at typically 100% for telehealth sessions that averted a trip. (See below for exceptions.)
It is set at some other % for telehealth sessions that are in addition to what would have required travel in the past. This factor is the value that stakeholders wish to place of these additional sessions and as such is expected to vary depending on the stakeholder's perspective. In this instance, it is an estimate of the present-day value of future monetary benefits of "new" telehealth.

Note: Sensitivity analyses were used to explore a range of values to determine the impact on the cost comparison, including calculation of a break-even point, where applicable.

Estimates by Type of Session

Averted Trips		Valuation Factor	
60%	of telehealth **clinical** sessions averted a trip: default 60%, range 40-90% (see below)	Valuation Factor for averted **clinical** trips assumed to be 100%	100%
40%	of telehealth **clinical** sessions are additional sessions (by subtraction)	There is real value to "new" **clinical** sessions. Consider a default Valuation Factor of 50%, range 25-100%.	**50%**
10%	of *educational* sessions averted a trip: default 10%	Valuation Factor for averted *educational* trips assumed to be 100%	100%
90%	of *educational* sessions are additional sessions (by subtraction)	There is real value to "new" *educational* sessions. Consider a default Valuation Factor of 30%, range 10-60%.	**30%**
1%	of *training* sessions averted a trip: default 1%. Set very low because these training sessions are not needed if there is no telehealth.	Valuation Factor for averted *training* trips assumed to be very low because *training* sessions are not needed if there is no telehealth but these TH sessions do provide some benefits beyond telehealth (5%)	5%
15%	of *training* sessions are additional sessions (by subtraction)	Valuation Factor for "new" telehealth assumed to be very low given that *training* sessions are not needed if there is no telehealth but these TH sessions serve an educational need. (5%)	**5%**
10%	of meeting sessions averted a trip: default 5%	Valuation Factor for averted meeting trips assumed to be 100%	100%
90%	of meeting sessions are additional sessions (by subtraction)	There is value to "new" telehealth if more people are able to attend meetings, but Valuation Factor is assumed to be low to reflect the choice and cost of staying in community versus travel. (5%)	**5%**
1%	of "other" sessions averted a trip (family visits, demos, tests): default 1%. Set very low because demos and tests are not needed if there is no telehealth.	Valuation Factor for averted "other" trips assumed to be low because demos and tests are not needed if there is no telehealth. There is real value to Family visits, but these are infrequent (1%)	1%
99%	of "other" sessions are additional sessions (by subtraction)	A similar argument can be made for "new" telehealth for "other" sessions.	**1%**
↑ **Estimates in red are best guesses.** *Pairs of estimates must sum to 100%*		↑ **Estimates in red are best guesses.** *Pairs of estimates are independent*	

Estimates Notes

	Averted Trips	Valuation Factor
Averted clinical	The Evaluation Team, with the support of KOTH and NORTH Network personnel, asked medical specialists to determine whether the telehealth session would have required an in-person consultation in the past. The survey was conducted in July, October and November 2005 at two referral sites. We received 35 responses from specialists in 10 fields. Surgery (8 references), psychiatry (7), and gastrointestinal (6) were the most frequent specialties listed. Sixty-eight percent of the telehealth sessions would have required a face-to-face consultation in the past and another 15% were considered as possibly requiring face-to-face in the past. It is assumed that most follow-up consults currently conducted by telehealth would have required a face-to-face consult in the past. Thus the percentage of clinical telehealth sessions that were conducted for follow-up consults is another estimate of averted travel. Data from 34 telehealth sessions suggest that 56% were for follow-up and the remainder were for initial consults. KOTH-North Network telehealth referral sheets were examined for seven First Nation communities for April 2003 to June 2005 to provide another estimate of the percentage of telehealth sessions used for follow-up. These data suggest than on average, 48% (median = 45%) of the telehealth sessions were for follow-up (Table D). The pooled average was 53%. The proportion of initial consultations done by telehealth that would have averted a trip is unknown. Three estimates of the percentage of telehealth sessions that averted travel were 68% and 56% (based on 35 specialist consults) and 45-53% (based on 402 referral sheets). We used 60% as the default estimate for percent averted travel, with a suggested range of 40-90%.	*There is no empirical basis for any estimate of the Valuation Factor.* The default estimates for the Valuation Factor are educated guesses based on expert opinion. It would be useful to explore the impact of other levels of the valuation factors on the final result. Suggested range would be 1/2 to 2 times that of default value for Valuation Factor.

Estimates Notes (continued)

Averted Trips	Valuation Factor
There is no empirical basis for any other averted travel estimate. The averted travel estimates for education, training, meetings and other were based in part on conversations with KOTH personnel and the evaluator's educated guess. A study of telepsychiatry in Norway by Gammon et al. (1996) found that 59% of the 140 telepsychiatry sessions would have required travel in the past. Approximately 25% was "new" telehealth with the remaining alternatives to telehealth being the telephone (14%) and mail/fax (2%). Approximately 50% of the telepsychiatry sessions were for meetings, 21% for clinical supervision, 14% for clinical work (typically without the patient), 10% for education and 5% for tests / demonstrations. Our default estimates for averted travel for non-clinical use are much more conservative given that the main mode of travel in Norway would be by road versus by air in Northwestern Ontario. Source: Gammon, D., et al. 1996. Videoconferencing in psychiatry: a survey of use in northern Norway. Journal of Telemedicine and Telecare 2:192-198.	

Travel Savings - Summary (clinical, educational, training, administrative and other)

Sustainable Program

Note: These estimated utilization numbers are for First Nations communities and are higher than that for the Network as a whole. Estimated utilization for First Nations communities is higher because one Network Session may involve on or more First Nations Communities.

Potential savings occur if travel to and from First Nations communities is averted and so First Nations community utilization drives the travel savings estimates. Any comparison of future utilization is made for the Network as a whole.

Average	8579	
Median	8631	
Low	1758	Value used to estimate savings → 8579
High	12411	
Ratio	6485	=global average

Model Assumptions — **Sustainable Program**

Item	*Clinical*		*Educational*		*Training*		*Administrative*		*Other*	
Total number of telehealth sessions- Projected Utilization		1538		2933		1080		2563		465
percent of telehealth sessions that averted travel		60%		10%		1%		10%		1%
averted number of trips	1538 * 0.6	923	2933 * 0.1 =	293		11		256		5
average number of people / trip		1.5		3		1.5		3		1
Valuation Factor (% of travel cost assumed to be savings) (previous sheet).		100%		100%		5%		100%		1%
New telehealth										
Number of new telehealth sessions	1538 - 923 =	615	2933 - 293 =	2640		1069		2307		460
Valuation Factor (% of travel cost assumed to be savings) - NEW TH		50%		30%		5%		5%		1%

Estimate BUILT UP from invoices, literature, commercial values											Sustainable Program
Cost Item	***Unit cost***	***Note***	*Clinical*		*Educational*		*Training*		*Administrative*		*Other*	
Itemized Costs / Trip												
Transportation Costs												
air fare (return-patient or 1st person)	$450		0.90	$405	1	$450	1	$450	1	$450	1	$450
air fare (medevac)	$5,000		0.10	$500								
air fare (patient goes home after medevac)	$270	60% of return fare	0.10	$27								
air fare (return-escort or other people)	$450		0.5	$225	2	$900	0.5	$225	2	$900	0	$0
Transportation sub-total				$1,157		$1,350		$675		$1,350		$450
Daily Costs												
accommodation-patient-SL hospital	$799		0.90	$719								
accommodation-patient-SL hostel	$28		0.10	$3								
accommodation-escort or others-SL hotel	$90		0.5	$45	3	$270	1.5	$135	3	$270	1	$90
food and misc.	$50	per diem, includes local travel, private accommodation etc.	1.5	$75	3	$150	1.5	$75	3	$150	1	$50
total cost for each day				$842		$420		$210		$420		$140
Number of Days per trip				2.5		2.5		1.5		1.5		1
Daily Costs sub-total			$842 * 3 =	$2,105		$1,050		$315		$630		$140
Other Costs / Trip				$1		$1		$1		$1		$1
Total average cost / trip-BUILT-UP estimate				$3,263		$2,401		$991		$1,981		$591
Total annual savings-BUILT-UP				$3,010,570		$704,189		$535		$507,746		$27
"New" telehealth travel savings				$1,003,523		$1,901,310		$52,987		$228,486		$2,721
Total annual savings-with "New" telehealth travel savings				*$4,014,093*		*$2,605,498*		*$53,522*		*$736,232*		*$2,748*

Sustainable Program

Values are adjusted here by savings sensitivity factor.		Annual Potential Travel Savings Estimate		Annual Potential Savings Travel Savings Estimate *with "New" telehealth*	
Savings Sensitivity	1.00				
Type of Averted Travel		Agency Values	Built-up estimate	*Agency Values*	*Built-up estimate*
Clinical		$2,257,927	$3,010,570	*$3,010,570*	*$4,014,093*
Educational		$528,142	$704,189	*$1,954,124*	*$2,605,498*
Training		$401	$535	*$40,141*	*$53,522*
Meeting		$380,810	$507,746	*$552,174*	*$736,232*
Other		$21	$27	*$2,061*	*$2,748*
Total		$3,167,301	$4,223,068	*$5,559,070*	*$7,412,094*

Assumptions and Values	**Type of Use**	**Basis for Estimate**
Utilization		
Total number of telehealth sessions- Projected Utilization	all types	Estimated use based on 9 FN communities with longest running TH service.
percent of telehealth sessions that averted travel	clinical	Based on 2 averted travel surveys (see Travel Module tab).
average number of people / trip	Clinical Training	patient + escort on 1 of 2 trips = 1.5 people CTC + backup every 2nd session = 1.5 people
Transportation Costs		
air fare (return-patient or 1st person)	Clinical	NIHB data for 21 FN communities in FY03/04 =$215/leg of tripx2=$430 (return) (50% of 1-way trips to Sioux Lookout, 30% to Thunder Bay & 20% to WPG). Average commercial return fare from 5 FN communities to SL (Jul-05) =$300 (includes tax) * 1.5 to include travel to Thunder Bay or Winnipeg =$450.
air fare (medevac)	Clinical	Average billing for April - December 2003 was $3,875 to $7,503 per trip for all of Ontario. Source: Office of the Auditor General, 2005. Chapter 3 Section 3.01 Ambulance Services - Air. Data from the PHCFT suggest that approximately 15% all trips were medevacs. The model assumes a conservative value of 10%.
Daily Costs		
accommodation-patient-SL hospital	Clinical	2005 interprovincial per diem rates for SLDHC (assumed to include meals). Source: Ministry of Health and Long-Term Care.
accommodation-patient-SL hostel	Clinical	Average cost of $28 per night per person includes 1.5 meals. 11,684 clients staged in hostel in fiscal year 2004/2005. Source: NODIN. Another source puts the figure at $78 per night (Keresztes C. and Shaw R. 2002. Evaluation of the Keewaytinook Okimakanak Telepsychiatry Pilot Project.)
accommodation-escort or others-SL hotel	all types	17,671 clients were placed in Sioux Lookout hotels in fiscal year 2004/2005 at an average cost of $90 a day. Source: NODIN. Average commercial costs of hotels in Sioux Lookout, Balmertown and Red Lake was $88-105, taxes included. July 2005.

User-Defined Key Variables

This page contains an interactive listing of variables that can be customized or changed by the user. Justification, such as by empirical data or journal article,

Worksheet (Tab) & Variable	Value	Explanation	Range and default
Annuitization of Telehealth Capital			
Amortization rate (%)	0.01%	Interest rate for depreciation or amortization of telehealth capital.	Suggested range 0.01 to 5%, default 0.01%.
Amortization period (months)	36	Sustainable program is budgeted for 3 years.	
Cost sensitivity factor	1.00	Adjustor to see how changes in costs affect overall results.	(1.2 = 20% more & 0.8 = 20% less costs), default 1.00.
Savings sensitivity factor	1.00	Adjustor to see how changes in savings affect overall results.	(1.2 = 20% more & 0.8 = 20% less savings), default 1.00.
Travel Module			
Averted travel			
Averted-Clinical	60%	Percent of telehealth **clinical** sessions that averted a trip.	Suggested range 40-90%, default 60%.
Not averted-Clinical	40%	Percent of telehealth **clinical** sessions that are new sessions (by subtraction).	Not averted obtain by subtraction (100% - % averted)
Averted-Educational	10%	Percent of **educational** sessions that averted a trip.	Default 10%.
Not averted-Educational	90%	Percent of **educational** sessions that are new sessions (by subtraction).	Not averted obtain by subtraction (100% - % averted)
Averted-Training	1%	Percent of **training** sessions that averted a trip.	Default 1%. Set very low because these training sessions are not needed if there is no telehealth.
Not averted-Training	99%	Percent of **training** sessions are new sessions (by subtraction).	Not averted obtain by subtraction (100% - % averted)
Averted-Meetings	10%	Percent of **meeting** sessions averted by a trip.	Default 10%.
Not averted-meeting	90%	Percent of **meeting** sessions that are new sessions (by subtraction).	Not averted obtain by subtraction (100% - % averted)
Averted-Other	1%	Percent of **other** sessions averted a trip (family visits, demos, tests). Set very low because demos and tests are not needed if there is no telehealth.	Default 1%.
Not averted-Other	99%	Percent of **other** sessions that are new sessions (by subtraction)	Not averted obtain by subtraction (100% - % averted)

Worksheet (Tab) & Variable	Value	Explanation	Range and default
Valuation Factor			
Averted travel (as a % of travel costs)			
Clinical	100%	Valuation Factor for averted **clinical** trips assumed to be 100%.	A trip averted is a trip saved, 100%.
Educational	100%	Valuation Factor for averted **educational** trips assumed to be 100%.	A trip averted is a trip saved, 100%.
Training	5%	Valuation Factor for averted **training** trips assumed to be very low because *training* sessions are not needed if there is no telehealth but these TH sessions do provide some benefits beyond telehealth.	Default 5%.
Meeting	100%	Valuation Factor for averted **meeting** trips assumed to be 100%	A trip averted is a trip saved, 100%.
Other	1%	Valuation Factor for averted "**other**" trips assumed to be low because demos and tests are not needed if there is no telehealth. There is real value to Family visits but these are infrequent.	Default 1%.
New telehealth (as a % of travel costs)			
Clinical	**50%**	There is real value to "new" **clinical** sessions.	Suggested range 25-100%, default 50%.
Education	**30%**	There is real value to "new" **educational** sessions.	Default 30%.
Training	**5%**	Valuation Factor for "new" telehealth assumed to be very low given that **training** sessions are not needed if there is no telehealth but these TH sessions serve an educational need.	Default 5%.
Meeting	**5%**	There is value to "new" telehealth if more people are able to attend **meetings,** but Valuation Factor is assumed to be low to reflect the choice and cost of staying versus travel.	Default 5%.
Other	**1%**	A similar argument can be made for "new" telehealth for "**other**" sessions.	Default 1%.

Worksheet (Tab) & Variable	Value	Explanation	Range and default
Travel Savings			
Estimated utilization in 24 First Nation Communities.	8579	This estimated utilization was used to estimate potential savings.	There is no default value. Estimated utilization derived from First Nation communities may differ from utilization derived from the Network as a whole because one or more First Nation communities may participate in a Network session.
Model Assumptions			
Average number of people / trip: * Clinical * Educational * Training * Administrative * Other	1.5 3 1.5 3 1	The number is above 1 if on average a patient has an escort. Educated guess	There should always be at least 1 person (the patient) on a trip, default 1.5. Default 3 people per trip / event. Default 1.5 people per trip / event. Default 3 people per trip / event. Default 1 people per trip / event.
Agency Values use % of built-up estimate (%	 75.0%		 Default 66.7%.
Estimate BUILT UP			
Percentage costing of trip: * Clinical * Educational * Training * Administrative * Other	0.9 1 1 1 1	The proportion of trips by schedevac, the remainder by medevac.	Default 0.9 (90%). Default 1 (100%). Default 1 (100%). Default 1 (100%). Default 1 (100%).

Worksheet (Tab) & Variable	Value	Explanation	Range and default
Transportation Costs			
Air fare (return-patient or 1st person)	$450	NIHB data for 21 FN communities in FY03/04 =$215/leg of tripx2=$430 (return) (50% of 1-way trips to Sioux Lookout, 30% to Thunder Bay & 20% to WPG). Average commercial return fare from 5 FN communities to SL (Jul-05) =$300 (includes tax) * 1.5 to include travel to Thunder Bay or Winnipeg =$450.	Default $450.
Air fare (medevac)	$5,000	Average billing for April - December 2003 was $3,875 to $7,503 per trip for all of Ontario. Source: Office of the Auditor General, 2005. Chapter 3 Section 3.01 Ambulance Services - Air. Data from the PHCFT suggest that approximately 15% all trips were medevacs. The model assumes a conservative value of 10%.	Default $5000.
Air fare (patient goes home after medevac)	$270	60% of return fare	Default $270.
Air fare (return-escort or other people)	$450	See "Air fare (return-patient or 1st person)" above.	Default $450.
Daily Costs			
Accommodation-patient-SL hospital	$799	2005 interprovincial per diem rates for SLDHC (assumed to include meals). Source: Ministry of Health and Long-Term Care.	Default $799.
Accommodation-patient-SL hospice	$28	Average cost of $28 per night per person includes 1.5 meals. 11,684 clients staged in hostel in fiscal year 2004/2005. Source: NODIN. Another source puts the figure at $78 per night (Keresztes C. and Shaw R. 2002. Evaluation of the Keewaytinook Okimakanak Telepsychiatry Pilot Project.	Default $28.

Worksheet (Tab) & Variable	Value	Explanation	Range and default
Accommodation-escort or others-SL hotel	$90	17,671 clients were placed in Sioux Lookout hotels in fiscal year 2004/2005 at an average cost of $90 a day. Source: NODIN. Average commercial costs of hotels in Sioux Lookout, Balmertown and Red Lake was $88-105, taxes included. July 2005.	Default $90.
Food and misc.	$50	per diem, includes local travel, private accommodation etc.	Default $50.
Number of Days per trip:	2.5		Default 2.5.
* Clinical			
* Educational	2.5	These values are educated guesses based on expert	Default 2.5.
* Training	1.5	opinion.	Default 1.5.
* Administrative	1.5		Default 1.5.
* Other	1		Default 1.5.
Other Costs / Trip:	$1		Default $1.
* Clinical			
* Educational	$1	These variables can be used to add any other travel	Default $1.
* Training	$1	cost.	Default $1.
* Administrative	$1		Default $1.
* Other	$1		Default $1.
Cost Comparison			
Limits for comparison	5%	Gives a range above and below the telehealth cost to determine if there are savings or expense.	Default 5%.

** Red values are educated guesses based on expert opinion.*

Methods for Comparing Costs to Savings

Utilization for the entire Network includes data for 25 First nations communities, several main referral sites, such as Sioux Lookout, Balmertown/Red Lake, Thunder Bay, Winnipeg and Toronto, as well as other locations across Canada.

The economic model starts with network utilization because it is easier to obtain.

There are data on the number of First Nations communities that have participated in each Network session and so the economic model is able to convert back and forth between Network Utilization and First Nations utilization.

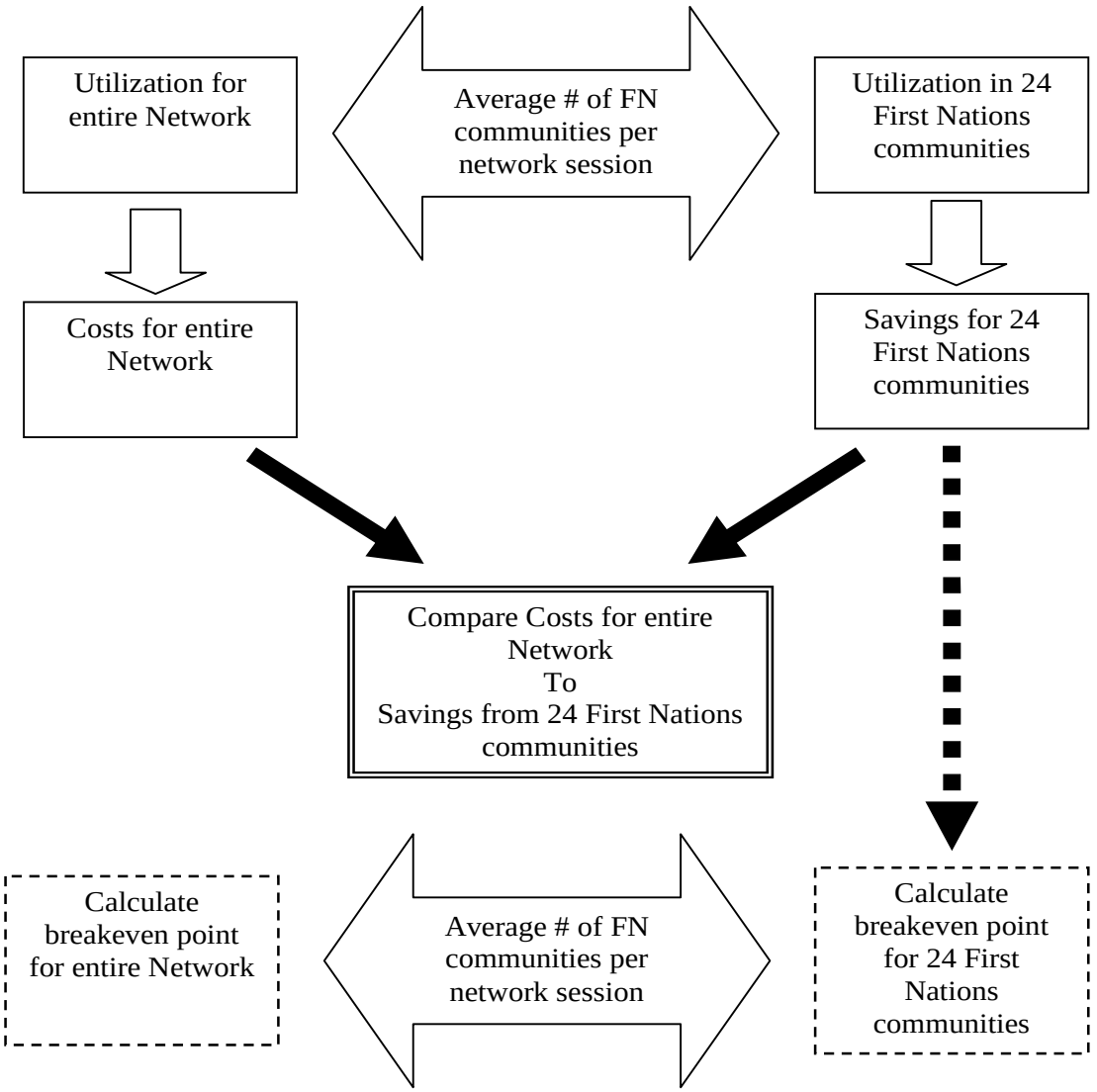
The model calculates travel savings for the 24 First nations communities. This is based on the argument that most of the averted travel would happen in these communities. In the past, it was the people in these communities who had to travel long distances to seek medical care and then return home.

Network Costs were apportioned by network utilization.

Potential Travel Savings were estimated for the 24 First Nations communities for each major type of use (e.g., Clinical, Educational).

Total costs can be compared directly to total savings. Costs (Network) and Savings (FN communities) for each type of use (e.g., clinical) can be compared because this reflects how the costs and savings occur.

Utilization numbers used for the Network have to be converted to Utilization numbers for the First Nations communities and vice versa.



Sustainable Program

Averted Travel Savings Only

Limits for comparison=	5%

Cost Comparison

Travel Savings = BUILT-UP estimate

Network Costs = DESIGN

	Clinical	*Educational*	*Training*	*Meetings*	*Other*	*Total*
Travel Savings-Averted Travel only	$3,010,570	$704,189	$535	$507,746	$27	$4,223,068
Network Costs	$1,078,465	$583,626	$500,758	$416,707	$230,846	$2,810,402
Net Cost/Saving (savings minus cost)	**$1,932,105**	**$120,563**	**-$500,223**	**$91,040**	**-$230,818**	**$1,412,666**

The Economic Model suggests that telehealth results in:

Savings	Savings	Extra Cost	Savings	Extra Cost	Savings

Sustainable Program

Limits for comparison=	5%

Averted Travel Savings & Monetary Value of New Telehealth

Cost Comparison

Travel Savings = BUILT-UP estimate

Network Costs = DESIGN

	Clinical	*Educational*	*Training*	*Meetings*	*Other*	*Total*
Travel Savings-Averted Travel + Value of New TH	$4,014,093	$2,605,498	$53,522	$736,232	$2,748	$7,412,094
Network Costs	$1,078,465	$583,626	$500,758	$416,707	$230,846	$2,810,402
Net Cost/Saving (savings minus cost)	**$2,935,628**	**$2,021,872**	**-$447,236**	**$319,526**	**-$228,098**	**$4,601,692**

The Economic Model suggests that telehealth results in:

Savings	Savings	Extra Cost	Savings	Extra Cost	Savings

Summary of Model Assumptions

Major Assumptions

1 Telehealth network costs were derived from:
Sustainability cost estimates obtained from KOTH
for equipment, connections, renovations/rental, personnel, etc.

2 Telehealth network costs were amortized over the duration of: 36 months.

Interest rate was:	0.01%
Cost sensitivity factor was:	1.00
Savings sensitivity factor was:	1.00

3 Telehealth network costs were approportioned by percent use, which was based on number of sessions for each type of use.

	Actual Use Based on Last 12 Months				Sustainable Program Based on Last 12 Months		
Type of Use	**Actual Network Use**	**Frequency of Network Use**	**Actual First Nations Use**	**Frequency of First Nations Use**	**Estimated Network Use**	**Average Number of First Nations Communities per Network Session**	**Estimated First Nations Use**
Clinical	911	38%	704	17%	1990	0.77	1538
Education	493	21%	1392	33%	1039	2.82	2933
Training	423	18%	613	15%	743	1.45	1080
Meetings	352	15%	1282	30%	704	3.64	2563
Other	195	8%	231	5%	391	1.19	465
Total	**2374**	**100%**	**4222**	**100%**	**4866**	1.78	**8579**

Note: These estimated utilization numbers are for First Nations communities and are higher than that for the Network as a whole. Estimated utilization for First Nations communities is higher because one Network Session may involve on or more First Nations Communities.

Potential savings occur if travel to and from First Nations communities is averted and so First Nations community utilization drives the travel savings estimates. Any comparison of future utilization is made for the Network as a whole.

Different methods could be to approportion telehealth network costs (e.g., total hours of use by each type of use, frequency or time of use by community). The different methods would not affect total cost, but could affect the cost is allocated to the major types of use.

4 Travel is the main alternative to telehealth and averted travel is the main cost savings. Other alternatives would be telephone calls, postal/courier delivery and "do nothing".

5 Not all telehealth sessions would have required travel in the past, some telehealth sessions are in addition to what had been delivered in the past.

From an economist's viewpoint, telehealth that averts travel usually has a different monetary value than "new" telehealth.
There were two estimates, each with two parts:

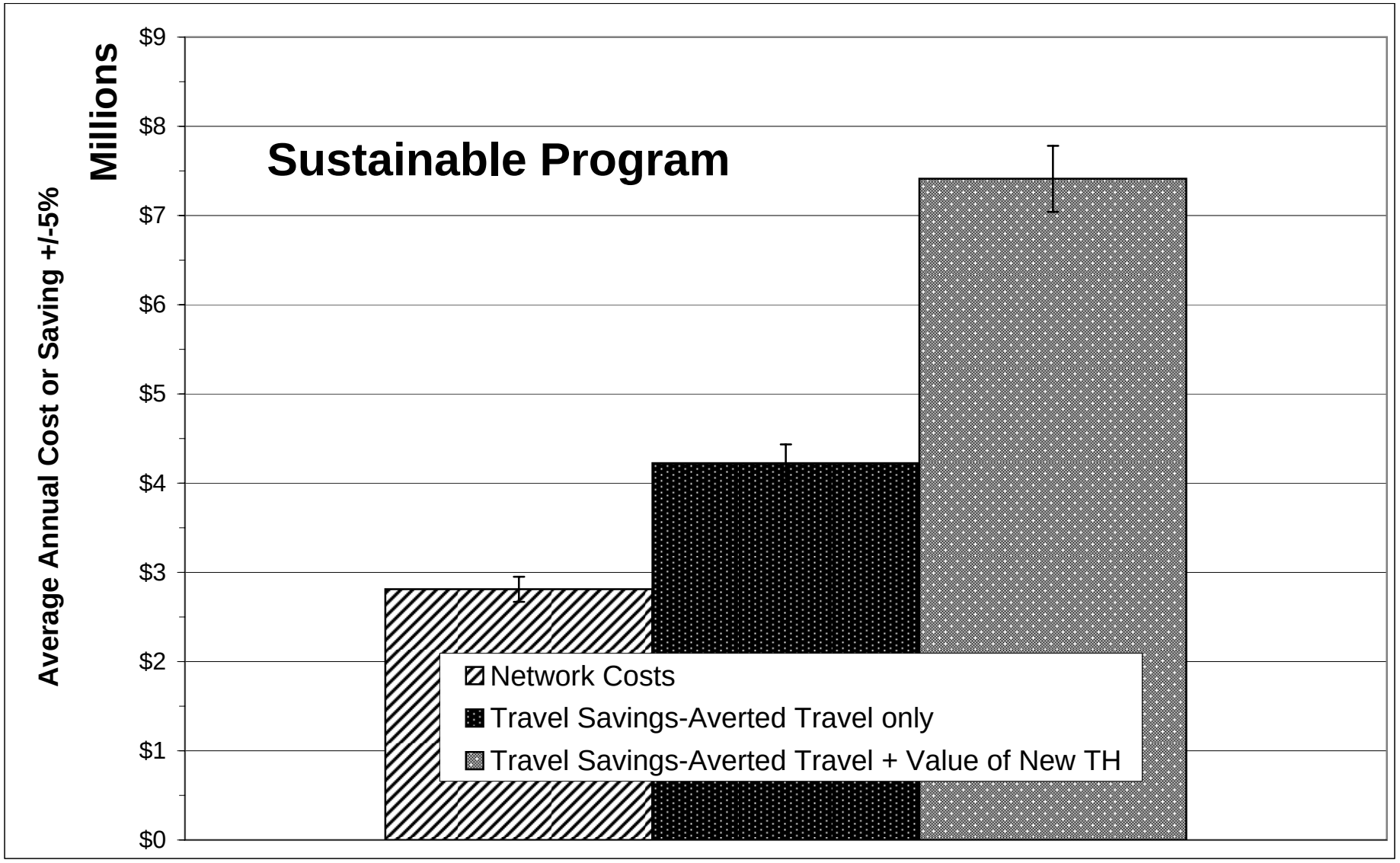
a. Percent of telehealth sessions that averted travel (the remaining telehealth sessions did not avert travel and were considered to be "new" telehealth). These estimates are linked and must sum to 100%.

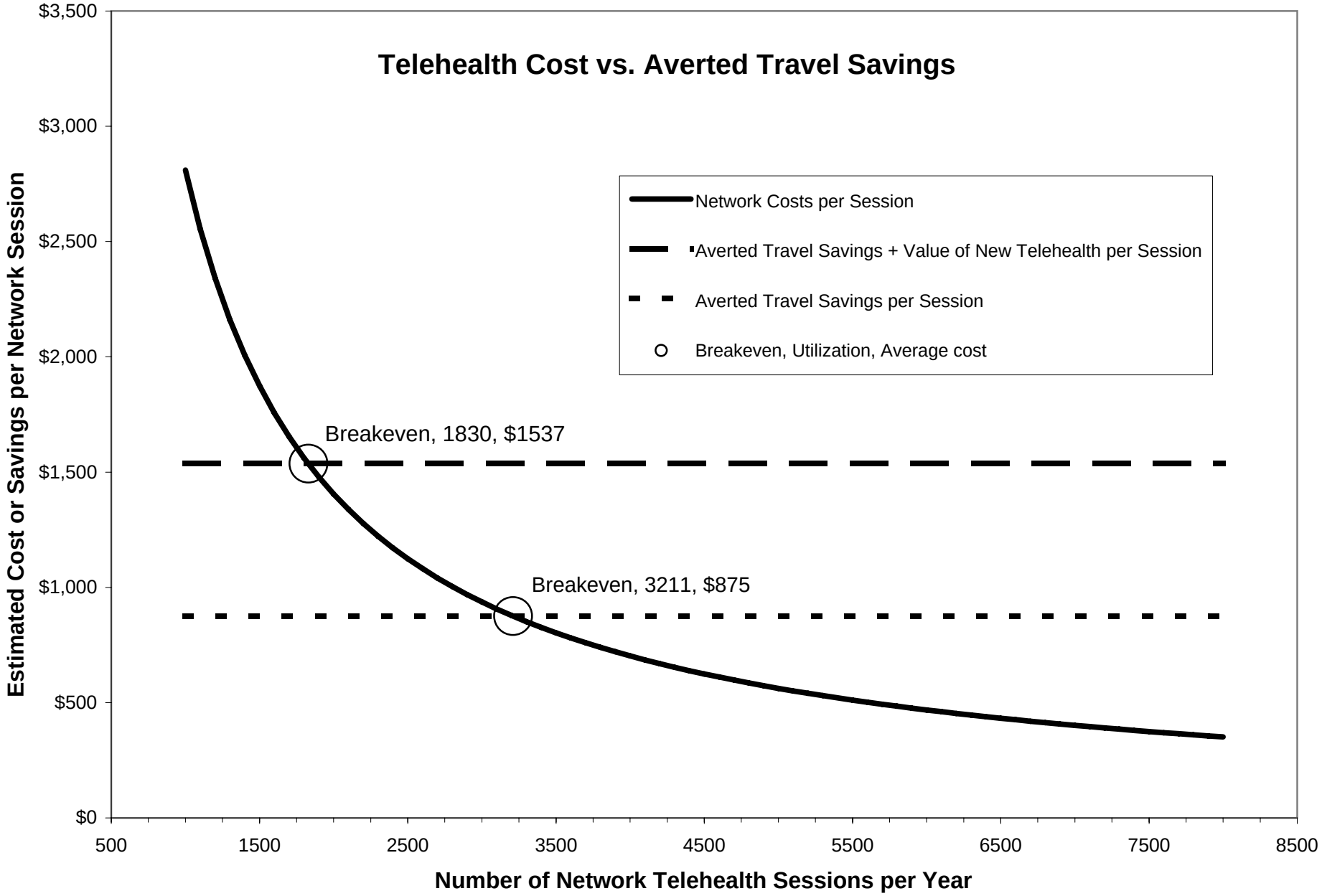
b. Valuation Factor, expressed as a % of travel cost eligible as savings: (i) 100% for telehealth sessions that averted travel (training and other telehealth sessions were valued at only 1% because these sessions would not exist except for telehealth; and (ii) some other % for telehealth sessions that did not avert travel (so-called "new" telehealth). These estimates are separate and distinct--they can sum to any number.

Type of Use	% of TH that Averted Travel	% of TH that is "New'
Clinical	60%	40%
Educational	10%	90%
Training	1%	15%
Meetings	10%	90%
Other	1%	99%

	Valuation Factor	
Type of Use	TH that Averted Travel	"New" TH
Clinical	100%	50%
Educational	100%	30%
Training	5%	5%
Meetings	100%	5%
Other	1%	1%

Model Output for Sustainable Program




Telehealth Cost vs. Averted Travel Savings
Estimated Cost or Savings per Network Session
$3,500
$3,000
$2,500
$2,000
$1,500
$1,000
$500
$0
500
1500
2500
3500
4500
5500
6500
7500
8500
Number of Network Telehealth Sessions per Year
Network Costs per Session
Averted Travel Savings + Value of New Telehealth per Session
Averted Travel Savings per Session
Breakeven, Utilization, Average cost
Breakeven, 1830, $1537
Breakeven, 3211, $875

Model/Theoretical Questions & Issues	Response
How should telehealth network costs be approportioned? Is % use the most appropriate way to approportion the cost? Should we use % of total time instead? Are there differences in cost/minute among the major types?	We are using percent based on frequency to approportion the costs. Biggest discrepancies in % allocation are for clinical frequency vs. time and for education frequency vs. time. Clinical sessions are more frequent but shorter compared to educational sessions.
Are all costs properly accounted for? The sustainable model does not include initial capital investments, but does include upgrades and maintenance costs. Is total funding a fair accounting of the cost? Are there 1-time costs that should be included? Should NOT be included? Taxes are included	The economic model represents the average annual costs of a fully operational, sustainable program with regular upgrades and maintenance over three years. Major start-up costs were not included.
The following costs/savings were not included in the model: lost/gained time (e.g., due to delays, cancellations, changes in productivity); increase/decrease in patient health status, anxiety, quality of life or well-being; increase/decrease in risks associated with increase/decrease in travel; delayed/timely intervention; and re-direction to the inappropriate/appropriate health care service.	The monetary value placed on these benefits and other benefits due to improved access and additional services or the value of prevention, early detection and early intervention is explored (indirectly) in the economic model by assigning a value to "new" telehealth".
Empirical data for each type of use (e.g., clinical, educational, meetings, training and other) are needed for: •percent averted travel •number of people/trip (# patients and # escorts for clinical) •number of days per trip •agency budgetary cost value •Consensus is needed on the valuation factor that pertains to dollar value allocated to new telehealth. How much is new telehealth worth in terms of travel costs? (What % of travel costs can be considered as "savings"?).	We have reasonable data for the % of telehealth that a averted travel for clinical sessions. Other estimates are best guesses.