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**TOWARD AN INDEX OF COMMUNITY CAPACITY:
PREDICTING COMMUNITY POTENTIAL FOR SUCCESSFUL PROGRAM
TRANSFER**

Since the Government of Canada (1969) White Paper, the Federal government has increasingly transferred the control of many programs to First Nations communities. The resulting negotiations have seen new relations and commitments develop within policy frameworks for strengthening First Nations' oversight of a variety of programs and services.¹ This evolutionary movement has been most obvious in the field of health and, sometimes, social services. Through the 1980s the Berger and the Penner reports encouraged First Nation's and Inuit control of these types of programs.² By the 1990s Treasury Board had approved the financial authority to fund transfer activities and community level management structures.³

This course of action was taken because First Nations occupy a distinct status in Canadian society. The more than 580 communities are unique culturally and politically in comparison with the rest of Canada. Their fifty-one languages, dispersed geography, particular histories and specific identities serve to distinguish them from one another, and from the rest of Canadian society. Uniqueness does not stop at language or social history. First Nations communities have developed differently across many economic and social indicators. For example, income levels, housing, educational attainment, governance structures, family characteristics, morbidity and migration patterns have evolved in different ways depending on local conditions.

First Nations communities are demanding and being given control of programs that have an impact on many areas of life. This study addresses a critical question: "Can we assess the capacity of communities to successfully implement and maintain transferred programs?" Resources of different types are not evenly distributed across First Nations communities. They have different capacities for accepting and successfully implementing transferred programs. Studies have suggested

¹ See Government of Canada (1975) *The Canadian Government-The Canadian Indian Relationships Paper*

² See, Government of Canada (1980) *The Report of the Advisory Committee on Indian and Inuit Health Consultation* (The Berger Report) and Government of Canada (1983) *Report of the Special Committee on Indian Self Government* (The Penner Report).

³ See Government of Canada 1999 *Ten Years of Health Transfer First Nation and Inuit Control*.

that the Government has at times transferred programs to First Nations communities that have little capacity to maintain them effectively. All too often, the result has been frustration and failure to provide the communities with the services that they need(Whitehead and Hayes 1999). The present study presents a tool designed to help identify the varying capacities of First Nations communities to accept and maintain transferred programs. It may also have implications for other aspects of self-determination as well.

THE COMPONENTS OF THE COMMUNITY CAPACITY INDEX AND THE UNDERLYING ASSUMPTIONS IN THEIR CONSTRUCTION

The development literature provides some insight into the elements might be logically included in the assessment of a community's capacity to successfully accept and implement the transfer of programs. The World Bank has a substantial literature that assesses the success and failure of aid as displayed in the development it generates. This literature is of limited applicability to program transfer because it looks largely at "aid" and whether "aid" is going to "work." In spite of these limitations, there are some promising ideas. The World Bank and the United Nations have come to the conclusion that there must be a clear assessment of the environment of the receiving country. The questions they pose are "What are the conditions that permit success?" and "What are the indicators of those conditions?" The World Bank argues that success is tied to the types of policies and institutions that the governments in these regions possess (World Bank 1999b). While this analysis is more applicable to programs of aid, it shows an understanding that the ability of the community to benefit from a transfer is a factor in the success of the program. In brief, it suggests that the levels of human and social capital in a community can influence the success of transfer of programs.

This paper is a first step in the creation of a Community Capacity Index (CCI) that has two components. These components reflect the dual aspects of the strengths and resources a community has at its disposal: human capital and social capital. This project constructs one component of the

CCI, based on human resources, and identifies the dimensions of the second component, social capital,⁴ which need to be addressed in the future.

THE SOCIAL CAPITAL COMPONENT

A key factor in whether a community has the capacity to successfully implement and manage programs is related to the stability of that community. The governance structure and “churn in leadership,” for example, make a difference as to whether sufficient stability exists to accept and administer a program. This notion of social capital has been central to research agenda in both North America and Europe (Coleman 1990; Grootart 1998). The *World Bank Working Group on Social Capital for Development* has argued that a growing body of evidence demonstrates that the social capital possessed by communities is a direct contributor to successful development on many fronts (World Bank Group 1999a:1).

While the concept of social capital is very likely a key aspect of any attempt to create a predictive tool, it is not easy to operationalize, “. . . measuring social capital may be very difficult, but not impossible and several excellent studies have identified useful proxies for social capital. . . . Trust, civic engagement and community involvement are generally seen as ways to measure social capital” (World Bank Group 1999a:1). At this time, we cannot measure these types of relationships in ways that are conducive to quantitative analysis. We are working on this problem and, likely, two sub-indices will be added in the future. The first is a measure of “institutional completeness.” This takes account of the existence of structures and services that show the vitality and potential for growth of a community. This may include the existence of a school and health clinic for example, but other institutional features need to be considered as well. The second sub-index would focus on governance. This would assess the political cohesion and effectiveness of the community. The index may focus on the frequency and extent of change (“churn”) of political leadership and the ability of local political leadership to deal effectively with other levels of government.

⁴ The data for constructing the social capital component is being created by the First Nations Social Cohesion Project at The University of Western Ontario.

Development on these subindices remains theoretical until the necessary data have been generated. For now, we will focus on the human capital component—an area where some empirical indicators are available.

THE HUMAN CAPITAL COMPONENT

Four sub-indexes measure human capital that reflect, *in toto*, the composite measure of the human resources that can be drawn upon to implement programs successfully. These sub-indices include the following:

- Population Size
- Age - Dependency Ratio
- Occupational Diversity
- Education

Each of these components is based on a set of explicit assumptions and empirical evidence of their reliability and validity. We review the assumptions on which each component is based below. The sub-indices are combined into a single CCI that measures the capacity of the 278 First Nations communities that we used as the basis for constructing this index.⁵

The Human Capital Sub-Index

The first component of the CCI is rooted in human capital theory (Becker 1964). The essence of this theory is that when investments are made in human resources, there is a return in the form of productivity of the population and this is reflected in the income that is earned. Much of the investigation of human capital by economists centres on “Is the investment in human resources cost effective?” Our concern is with effects at two levels: 1) a social (collective) return; and 2) an individual (income) return that accrues from education and training (Gunderson and Riddell 1988). Considerable empirical support exists for this approach (Hanson 1970; Dooley 1986; Ashenfelter 1978). Several Canadian studies of patterns of income among First Nations persons have verified

⁵For this process we could use only 278 of the 530 census communities because income data were not available for the other 252.

the existence of a return for each year of education for Aboriginal Canadians (White, Maxim and Whitehead 2000; Bernier 1997; George and Kuhn 1995).

This analysis assumes that levels of education are indicators of capacity to perform a variety of tasks including those necessary to implement and manage programs at the level of the individual and the community.

Measurement of returns on human capital indicate that the incremental return on investment varies considerably. This depends on the labour market conditions facing the individual and also on the labour market conditions facing the social group to which that person belongs. Pendakur and Pendakur (1996) find evidence of discrimination in the labour market with respect to the income return for education for visible minorities (Pendakur and Pendakur 1996). The same appears true for Aboriginal Peoples (Clatworthy et al. 1995). The present study focuses on First Nations communities so capacity is measured within communities. Therefore, there is shelter from the effects of external market discrimination for the purpose constructing the index.⁶

The aggregate data for First Nations communities (see Appendix A, Data Sources and Populations Studied) are employed for the population between 15 and 64 years of age. Education is dichotomized into two categories: those with high school education or less, and those with some training beyond high school. This means that for persons with less than grade 9 and those with grades 9-13, with or without a secondary school graduation certificate, are collapsed into the first category. The second category consists of persons with trades certificates or diplomas only, other non university education (with or without a certificate or diploma), university without a bachelors degree or higher, and university with a bachelors degree or higher. Descriptive statistics are used to set the breakpoints on the educational continuum. Values are assigned to the categories (see Appendix B for details). The robustness of the index, in explaining the variance in the proxy for capacity (mean community income), is quite high.

Population Size and The Age Dependency Ratio

⁶This is the same reasoning used to assess protected occupational labour market segments referred to as labour market sheltering. For a discussion, see Freedman (1976).

Both the size and structure of a population can affect the capacity of a community to implement transferred programs successfully. We have included a simple measure for predicting capacity based on size. Logically a community with five people, for instance, could not administer its own health program. The base of citizens could not provide the infrastructural labour needed to do the work. Cut points that make sense intuitively have been selected, but they comprise wide enough population bands to give a reasonable, but crude, measure.

While size is important, the composition of a population is also a critical factor. It is a common and well-established practice in demographic analysis of regional or national labour market issues, to calculate a dependency ratio from the statistics on population age, separate from actual economic involvement (Shryock et al 1980:358). The purpose of this is to get a measure of the proportion of the population that is potentially economically active. In brief, this is a measure of the potential labour force in relation to those who are dependant on that base. The ratio takes all persons in the age group 15 to 65 and assumes them to be producers while all those younger and those older are assumed to be dependent. The number can be greater than 1.0 if there are many young and old persons in relation to the “productive adults” but it is usually a fractional value. The Age Dependency Ratio (ADR) is calculated as follows:

$$ADR = \frac{\text{population under 15 years} + \text{population 65 years and over}}{\text{population 15- 64 years of age}}$$

This can be used in the assessment of community capacity because it suggests the pool from which those who will administer programs will be drawn in comparison with those sub-populations that will almost exclusively draw on community resources. It is also a crude maximum measure because it does not take into account actual participation in the labour force. Its advantage is that it identifies the outside limits of capacity.

In First Nations communities, we assume the age structure has a dramatic effect. The larger cohorts of young people, particularly those less than 15 years of age, will represent a negative pressure on the potential for successful program transfer. The younger cohorts are largely consumers of program and services as they do not possess the training or education to be “productive,” in terms

of generating goods and services. Similarly, we assume that those 65 and older will be net consumers of services. This is born out most clearly in the consumption of health care resources. Also, for First Nations persons, average educational levels are lower for those over the age of 60 years. This suggests that this group would have less formal education to contribute to the productive side of program transfer outcomes (George and Kuhn 1995).⁷

The ADR cannot, by itself, be taken as a definitive indicator of the pool from which capacity derives. It taps potential, but needs to be supplemented by a measure of available human resources that is based on the desire and capacity for participation. For this we examine the usefulness of an economic dependency ratio and settled on an index of occupational diversity.⁸

Occupational Diversity Index

The Occupational Diversity Index provides an indication of the distribution of workers across occupations. An index value of 0 indicates that everyone in the community is in a single occupation; an index value closer to 1 shows an even distribution across all occupations. The number of occupational categories determines the maximum value of the index used. Generally, the more categories included in the index, the larger the maximum value the Index of Dissimilarity can have. With five categories, the index can have a maximum value of 0.8; with ten categories, the maximum value is 0.9. Because of this feature, it is essential that the same number of occupational categories be used for each community. Thus, it is the relative value on the index across communities that is important. The absolute value of the index is of less interest.

⁷This should be tempered with the understanding that the elderly have a lot of experience and contribute through the sound advice and direction that comes from that experience.

⁸Not all persons between the ages of 15 and 64 show an equal ability or willingness to be productive in the community. This unevenness affects the capacity of the community. The economic dependency ratio gives a measure of this.

The economic dependency ratio is also a well established demographic indicator. Shryock et al. (1980: 335) define it as “the ratio of the economically inactive population to the active population over all ages”; simply put, nonworkers to workers. For the present purpose, we are not concerned with those less than 15 years of age or those more than 65 years of age, because a measure of their effect is at the heart of the age dependency ratio.

The economic dependency ratio, based on rates of participation, includes all those persons employed or seeking employment, over the total population 15- 65 years of age. This provides a measure of the capacity to work. However, the explanatory power of the variable is not strong in accounting for variation in income. Therefore, no strong case exists for its inclusion and, instead, we chose to use a different index that has a window on the labour market—an Occupational Diversity Index.

Formally, the Index of Diversity is $1 - \sum_{i=1}^I p_i^2$ where p_i is the proportion of people in a given occupation, i , and I is the total number of occupations. As an example, consider a community of 465 persons in the labour force with seven occupational groups labelled A through G. With the distribution illustrated in the accompanying table, the Index of Dissimilarity would be $1 - 0.210$ or 0.790 .

Occupation	Number	Proportion	p_i^2
A	20	0.043	0.002
B	40	0.086	0.007
C	20	0.043	0.002
D	35	0.075	0.006
E	100	0.215	0.046
F	140	0.301	0.091
G	110	0.237	0.056
Total	465	1.000	0.210
Index			0.790

For this study, we have taken the specific occupational groups from the 1996 Census of Canada Table 95f0246xdb96001.csd. Because of the small populations in most communities, occupations are aggregated at a crude level. Specifically, the following groupings were used: management occupations; business, finance and administrative occupations; occupations in the natural and applied sciences; health occupations; occupations in social science, education, government service and religion; occupations in art, culture, recreation and sport; sales and service supervisors; trades, transport and equipment operators and related occupations; occupations unique to primary industry; and, occupations unique to processing, manufacturing and utilities.

HOW CAN WE KNOW THE CCI MEASURES CAPACITY?

The best outcome measure on which to test the scale would be an actual evaluation of the outcomes of a program transferred to many First Nations communities. *To date, an evaluation of such a program does not exist.* Health Canada has been conducting a short and long term analysis of their

transferred programs (Government of Canada 1999), but the level and success of transferred programs are uneven to date and the evaluations are still in progress.

An alternate measure of effectiveness, for the purposes of testing the index, would be a proxy that is clearly identifiable as related to community success. We are constrained by the nature of the data that are available at the community level. The test we apply is based on average income in the community. For analytical purposes, its natural logarithm is used. Table 1 displays the results of a regression analysis conducted to assess the CCI. All of the measures are significant and cumulatively they account for about 23% of the variance in the community's ability to secure income.⁹

Table 1

Regression Analysis of Sub-Indices on the Dependant Variable Log of Mean Community Income

Dependent Variable: LOGWAGE N: 278 Multiple R: 0.479 Squared multiple R: 0.229
Adjusted squared multiple R: 0.218 Standard error of estimate: 0.255

Effect	Coefficient	Std Error	Std Coef	t-value	P(2 Tail)
CONSTANT	8.936	0.062	0.000	143.831	0.000
SIZE	0.077	0.018	0.227	4.215	0.000
SCHOOL	0.096	0.030	0.199	3.226	0.001
AGE-DEP	0.085	0.023	0.228	3.637	0.000
CATDIV	0.053	0.030	0.098	1.755	0.080

Analysis of Variance

Source	Sum-of-Squares	df	Mean-Square	F-ratio	P
Regression	5.282	4	1.321	20.282	0.000
Residual	17.774	273	0.065		

The next stage is to construct the Community Capacity Index (CCI). The simple combination of the indices would only be valid if the amount of variance explained was roughly equal for each of the components. Review of the coefficients in Table 1 leads to the conclusion that this is the case.

⁹This phase of the project is testing the validity of the indices by correlating them with the log of average income of the community. For this process we were forced to use only 278 of the 530 census communities because data on income were unavailable for the other 252. Later in the paper we run all the communities through the evaluation by the indices where Statistics Canada had collected data in the 1996 census with the exception of 31 communities where there were no data on occupation. This left a sample of 499 communities.

As the coefficients suggest, the sub-indices are of similar size, therefore, they are not weighted in the creation of the CCI.

CONSTRUCTING AND TESTING THE COMMUNITY CAPACITY INDEX

To be useful, an index needs to have three properties:

1. It must provide a value that allows comparability between communities that is meaningful and robust;
2. It must be simple to use and understand; and
3. It should be testable (i.e., falsifiable).

The Community Capacity Index has these three properties. Table 2 presents the sub-indexes as categorical constructs that have values attached to them. Rather than creating a single index that must be applied in a complicated mathematical model, the index is simplified by having point values designated for each categorical condition based on predetermined cut points.

Table 2 Sub-indexes with Assigned Point Values

Sub-index	Number of points assigned
Education Sub-index ¹⁰ 0 to 49% have post-secondary 50- 64% have post-secondary 65% to 74% have post-secondary 75% and above	0 points 1 point 2 points 3 points
Population Size 100-499 500-999 999-1999 2000+	0 points 1 point 2 points 3 points
Age Dependency Ratio .75+ .51-.74 .26-.49 .25 and less	0 points 1 point 2 points 3 points
Occupational Diversity 0-.69 .70-.74 .75-.84 .85+	0 points 1 point 2 points 3 points
Community Capacity Index	Points Total

Table 3 presents the array of scores for the communities when they are rated on the individual sub-indices, one at a time. The table groups the results by each sub-index, e.g., education and population size. The first column shows the number of communities falling into the value category. For example, on the sub index of population size, 120 or 43.2% of the 278 communities receive 0 points, and only 12 or 4.3% get the maximum score of 3 points.

¹⁰Education is dichotomized into two categories: those with high school education or less, and those with some training beyond high school. In terms of the available data, this means that those with less than grade 9 and those with grades 9-13, with or without a secondary school graduation certificate, are collapsed into the first category. The second category consists of those with trade certificates or diplomas only, other non-university education (with or without a certificate or diploma), university without a bachelors degree or higher, and university with a bachelors degree or higher. This index is based on the percent of the community with the post secondary education. This is much more reliable as a predictor of variance than lower educational cut-offs.

Table 3: Counts of Communities as Ranked by Sub- Indices

Size of community				
Count	Cum. Count	Percent	Cum. Percent	Value
120	120	43.2	43.2	0
103	223	37.1	80.2	1
43	266	15.5	95.7	2
12	278	4.3	100.0	3
School				
Count	Cum. Count	Percent	Cum. Percent	Value
203	203	73.0	73.0	0
62	265	22.3	95.3	1
10	275	3.6	98.9	2
3	278	1.1	100.0	3
Age dependency				
Count	Cum. Count	Percent	Cum. Percent	Value
12	12	4.3	4.3	0
82	94	29.5	33.8	1
137	231	49.3	83.1	2
47	278	16.9	100.0	3
Occupational Diversity				
Count	Cum. Count	Percent	Cum. Percent	Value
9	9	3.2	3.2	0
34	43	12.2	15.5	1
221	264	79.5	95.0	2
14	278	5.0	100.0	3

HOW DO FIRST NATIONS COMMUNITIES SCORE?

The result of applying the full CCI to First Nations communities appears in Table 4. The range on the CCI is 0 to a maximum of 12 and this represents a continuum on which the relative position of communities shows a level of potential to succeed or fail.

Table 4
Community Capacity Index: Community Scores

Community Count	Cumulative Count	Percentage	Cumulative Percentage	CCI Point Level
1	1	0.4	0.4	0
8	9	2.9	3.2	1
9	18	3.2	6.5	2
35	53	12.6	19.1	3
77	130	27.7	46.8	4
65	195	23.4	70.1	5
45	240	16.2	86.3	6
19	259	6.8	93.2	7
9	268	3.2	96.4	8
8	276	2.9	99.3	9
2	278	0.7	100.0	10+

Figure 1 describes how one should view the values generated by the index.

The results suggest that a wide range exists in capacity among First Nations communities. Transition or cut-points where communities would more likely fail or more likely succeed are identified in the following section where the analysis was performed on all First Nations

Table 5: Counts of Communities as Ranked by Sub-Indices and the CCI.

Count	Cum. Count	Pct.	Cum. Pct.	SIZE
341.	341.	68.3	68.3	0
103	444.	20.6	89.0	1
43.	487.	8.6	97.6	2
12.	499.	2.4	100.0	3

Count	Cum. Count	Pct.	Cum. Pct.	SCHOOL
337.	337.	67.5	67.5	0
117.	454.	23.4	91.0	1
37.	491.	7.4	98.4	2
8.	499.	1.6	100.0	3

Count	Cum. Count	Pct.	Cum. Pct.	AGE DEPENDANCY
35.	35.	7.0	7.0	0
110.	145.	22.0	29.1	1
208.	353.	41.7	70.7	2
146.	499.	29.3	100.0	3

Count	Cum. Count	Pct.	Cum. Pct.	CATDIV
92.	92.	18.4	18.4	0
86.	178.	17.2	35.7	1
303.	481.	60.7	96.4	2
18.	499.	3.6	100.0	3

Count	Cum. Count	Pct.	Cum. Pct.	SCALE
Cluster 1				
8.	8	1.6	1.6	0
25.	33.	5.0	6.6	1
32	65.	6.4	13.0	2
87.	152.	17.4	30.5	3
Cluster 2				
128	280	25.7	56.1	4
105	385.	21.0	77.2	5
Cluster 3				
67	452	13.4	90.6	6
27.	479.	5.4	96	7
10.	489.	2.0	98.0	8
8.	497.	1.6	99.6	9
2.	499.	0.4	100.0	10

These communities would have to be assessed on a case by case basis. Using the results of sub-

indices might identify particular weaknesses that could be addressed, such as size, where outside personnel would remedy the situation or clustering with neighbouring small reserves given political and cultural compatibility. Cluster 3 groups 114 communities (22.8%) that would be highly likely to succeed.

If we look at the figures we can see some interesting patterns. Figure 2 maps First Nations communities by the size sub-index. We can see from the data that the communities are generally smaller but the mapping indicates interesting patterns. The Lower Mainland of British Columbia has clusters of smaller communities. However, the closer proximity of the communities indicates that clustering some communities and setting up joint administration of programs is a possibility.

Figure 3 maps communities by age dependency ratios. The communities generally show positive dependency ratios because while the fertility rates are higher and there are more youth, the average life span is lower and there are fewer over 65 year olds.

Figure 4 maps communities by levels of education. We can see that the Prairie provinces demonstrate a higher concentration of communities with lower levels of post secondary education. The same is true for northern communities in general.

Figure 5 maps communities by the Occupational Diversity sub-index. We can see that there are few patterns in the distribution of the communities. Proximity to major urban centres has some positive effect but even this appears to explain very little.

The last figure (6) gives us a geographic representation of the distribution of communities by the full index. The Prairie Provinces and Northern communities in general show patterns of lower capacity whereas those communities in the B.C. lower mainland, the Maritimes and areas of Ontario show some clustering of higher capacity.

CONCLUSIONS

If it is possible to decide, within reasonable bounds of predictive accuracy, whether a community has the quality and quantity of human resources to successfully accept and implement downloaded programs, there can be a more reasoned strategic approach to carry out the current mandate of bringing control of policy into the hands of those affected. The tool developed here can neither answer all questions nor is it capable of exact prediction. It is only one component of a broader index of Community Capacity. A second component cannot be built until the data necessary for its construction are available. Fortunately, the First Nations Cohesion Project at the University of Western Ontario is constructing the very information base needed to complete this CCI tool. As it stands now, the CCI can suggest the kind of short fall that potentially exists and therefore indicate what preparatory action may be necessary. It can be used to estimate where communities fall relative to one another and provides some opportunity to assess the relative strengths of the community and the relative success possibilities regarding successful program transfer. It can also be diagnostic in cases where there has been difficulty in successful transfer by pointing out the areas where the community may wish to improve its level of capacity for the future.¹²

This CCI, as presented, is only one component of a complete Community Capacity Index. The data are simply not available to construct the social capital side of the tool. When that is done, the CCI will be a more powerful predictor and diagnostic tool than it is now.

In the future, when reports are available on the success or failure of program transfers, the CCI could be used as a diagnostic tool to detect those aspects of the structural relationships within the community that enhance or hinders the likelihood of successful program implementation.

¹²Another use for the index is to diagnose potential underlying reasons for the apparent failure in the implementation of a program. The CCI can be used in two stages to effect such a diagnosis. First, the community could be assessed using the CCI itself. It could then be compared to the distribution of communities reported in Table 3, which would indicate the relative capacity of the communities. The second stage of analysis would be to examine each of the component indices for the community to determine which of the underlying factors indicates the greatest problem.

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Appendix A

Data sources and Populations studied

All the data used in calculating the various index values come from the 1996 Census data (Community level data files [CSD]). In 1996, Statistics Canada collected data from 751 populated geographical units that qualified as First Nations communities as defined in this study.¹³ We assumed that communities with populations of fewer than 65 adults aged 15 to 64 years would likely have an inadequate population to sustain program transfer. We concluded that these communities would have to be clustered by considering geography, culture, and governance structures. These communities would automatically be classified as having lower capacity until they are actually linked with others to form a minimum basic population level. These small communities comprise less than 5 percent of the Registered Indian population of enumerated First Nations communities. This is similar to the methods employed in previous studies (see, Armstrong and Rogers, 1996). We should note that some government agencies (e.g., Medical Services Branch of Health Canada) are developing some basic clustering procedures that may be ready for analysis later in 2000.

Statistics Canada applies random rounding procedures to data retrieval from the Census database, to maintain confidentiality. They randomly assign zero-values to counts of 0, 1, 2, 8, and 9, and 5 to counts of 3, 4, 5, 6, 7. This problem confounds the counts for the smallest communities and contributes to overall error due to rounding. Therefore, it is possible that anomalies might appear in the study when communities have small populations.

In the end we processed the characteristics for 278 communities, representing approximately 80% of the First Nations population.

¹³ Census enumeration was not completed in another 77 communities, representing somewhere in the vicinity of 44,000 residents in First Nations communities.

Appendix B

Constructing the Indices

Each index is developed through a series of steps:

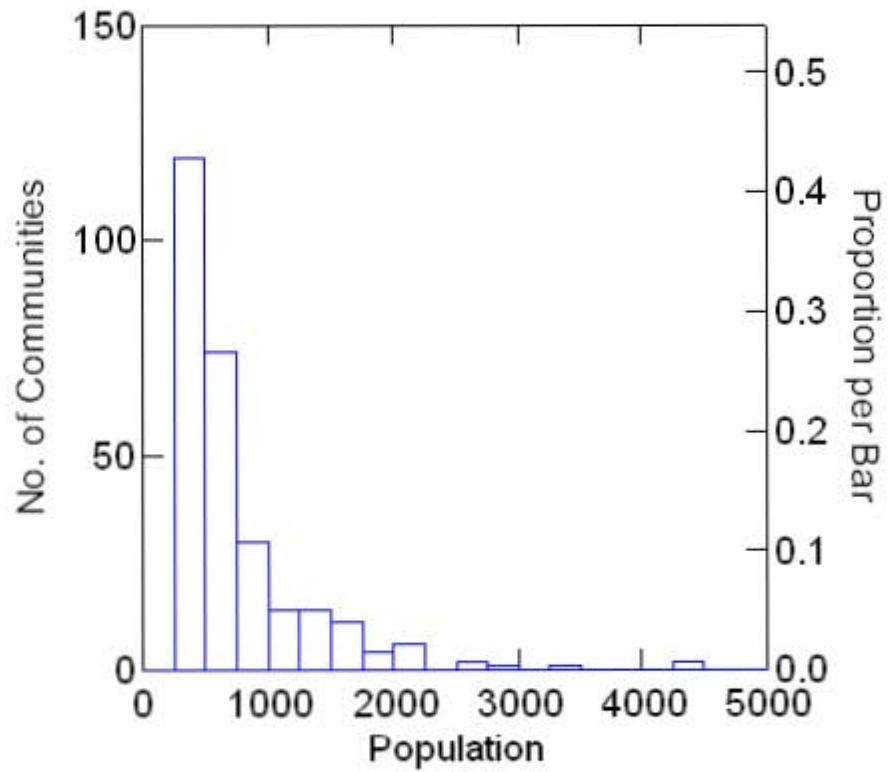
1. Determine potential measures for sub-index and calculate descriptive statistics (Tables App. 2-A through Appendix 2- G). Where appropriate commentaries are provided.
2. Determine a test of capacity by selecting a proxy that reflects a community's success in matters similar to or related to program transfer. We had to choose from readily available data and therefore chose income taking its mean and then using a log transformation to reduce heteroscedasticity and enhance reliability.
3. Determine whether the index is robust in explaining the variance in capacity. We regressed the log of the average income in the community on the individual indices to find their individual contribution, and to find whether they need be weighted in the final CCI. Table Appendix 2-H shows that all the indices are statistically significant and the size of the coefficients suggests that leaving the components of the CCI unweighted is reasonable.

APPENDIX B-2

First Nations communities generally cluster at the lower end of the population curve. The vast majority consist of fewer than 1000 persons.

Figure B-2

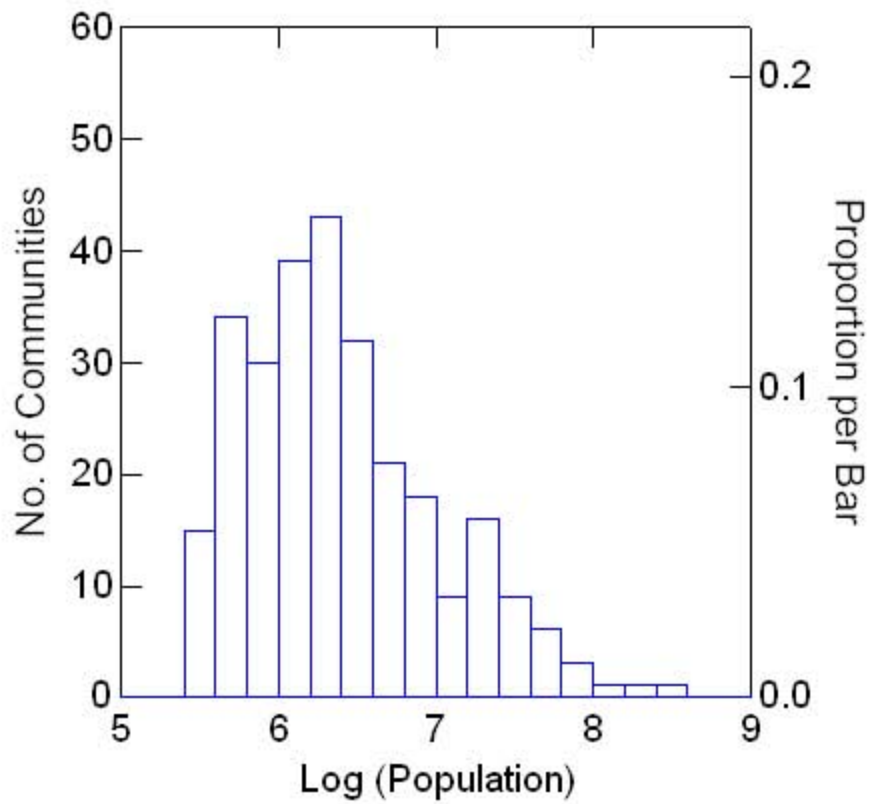
Distribution of Communities by Population



APPENDIX B-3

Figure B-3

DISTRIBUTION OF COMMUNITIES BY LOGARITHM OF POPULATION

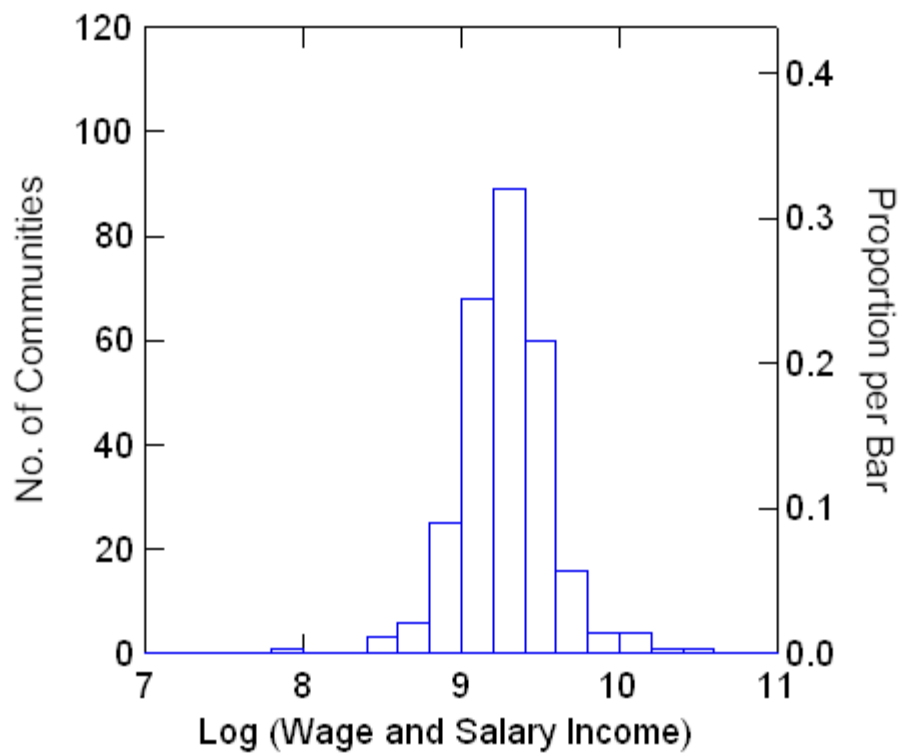


APPENDIX B-4

The distribution of simple wage and salary income shows a skew to the top of the range, leading to the decision to do a log transformation.

Figure B-4

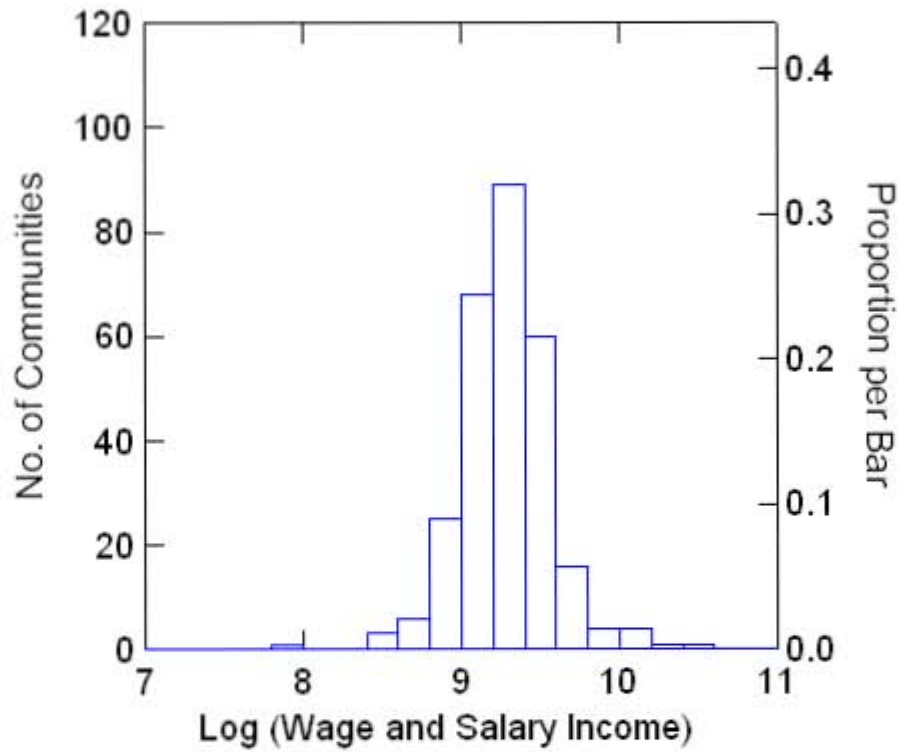
Distribution of Logarithm of Wage and Salary Income



APPENDIX B-5

Figure B-5

Distribution of Logarithm of Wage and Salary Income

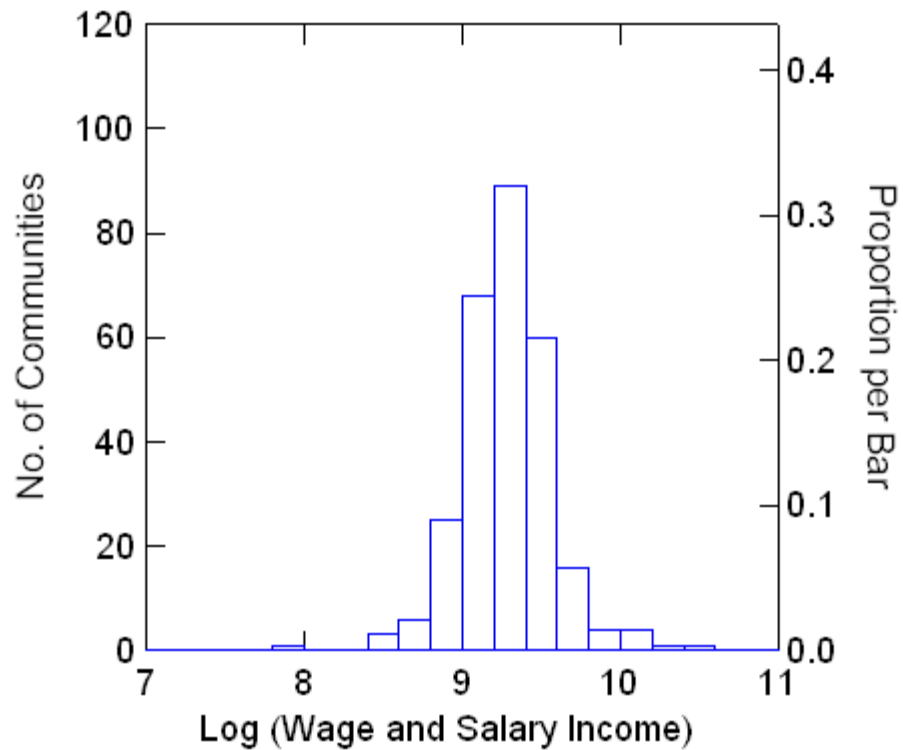


APPENDIX B-6

The comparisons of Figure B-5 and Figure B-6 show that utilizing the log transformation was a useful means of smoothing out the curve of wages and salaries.

Figure B-6

Distribution of Logarithm of Wage and Salary Income

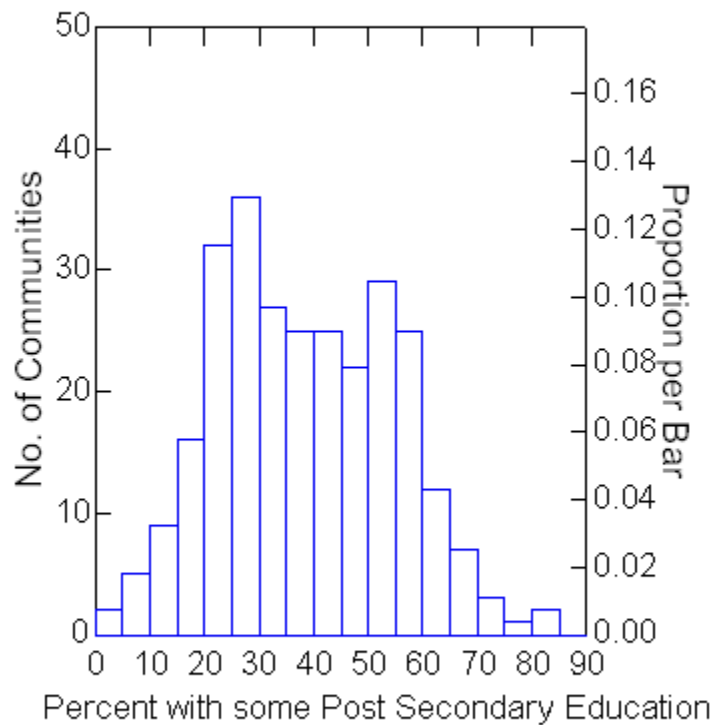


APPENDIX B-7

The usual markers for education are those with high school and those without. We found that looking of the communities at the higher end skill pool was much more telling.

Figure B-7

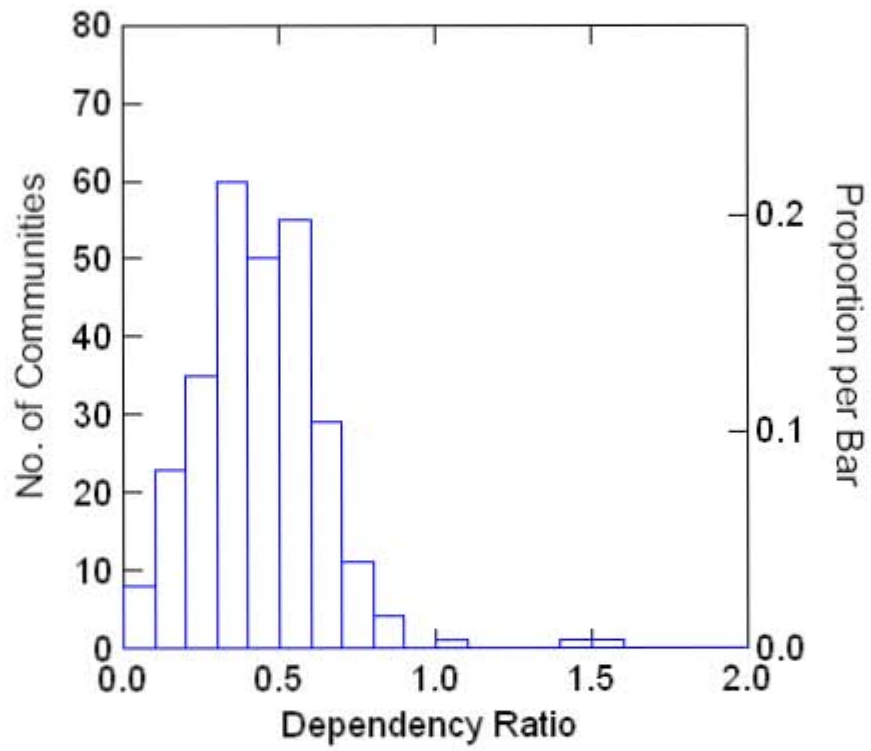
ution by Percent of Community with some Post Sec



APPENDIX B-8

Figure B-8

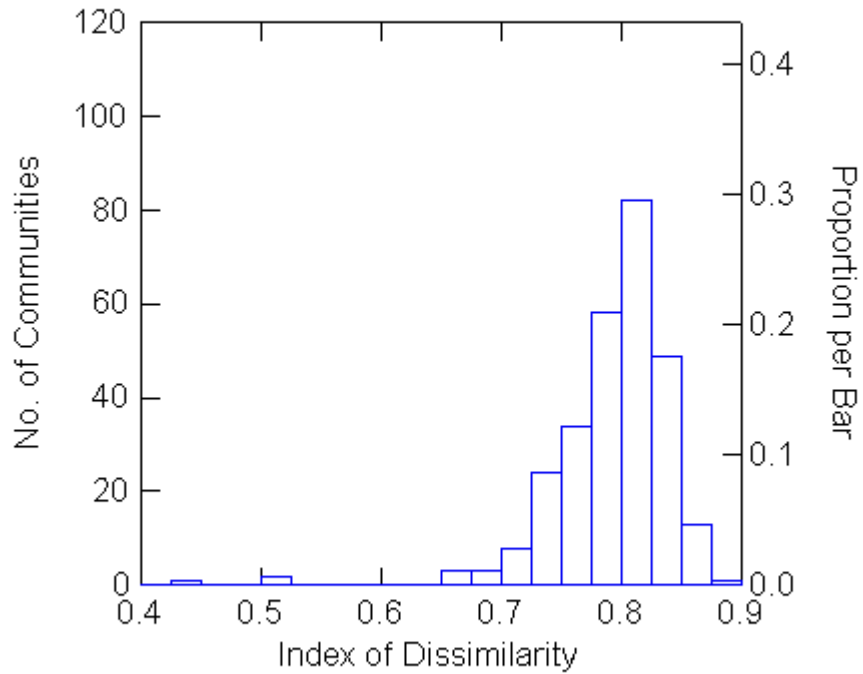
Distribution Communities by Dependency Ratio



APPENDIX B-9

Figure B-9

DISTRIBUTION OF COMMUNITIES BY INDEX OF OCCUPATIONAL DISSIMILARITY



The range of occupations, i.e., the diversity of occupations, available in a community is a powerful explanatory measure of capacity. The distribution of scores is unusual, but significant in determining capacity.

Appendix B-10

Regression Analysis of Sub-Indices on the Dependant Variable Log of Mean Community Income

Dep Var: LOGWAGE N: 278 Multiple R: 0.479 Squared multiple R: 0.229
 Adjusted squared multiple R: 0.218 Standard error of estimate: 0.255

Effect	Coefficient	Std Error	Std Coef	Tolerance	t	P(2 Tail)
CONSTANT	8.936	0.062	0.000		143.831	0.000
SIZE	0.077	0.018	0.227	0.976	4.215	0.000
SCHOOL	0.096	0.030	0.199	0.743	3.226	0.001
AGE-DEP	0.085	0.023	0.228	0.717	3.637	0.000
CATDIV	0.053	0.030	0.098	0.912	1.755	0.080

Analysis of Variance

Source	Sum-of-Squares	df	Mean-Square	F-ratio	P
Regression	5.282	4	1.321	20.282	0.000
Residual	17.774	273	0.065		

The coefficients are all significant and they contribute relatively equally to the overall variance explained of 22.9%.