Early Development in Vancouver: Report of the Community Asset Mapping Project (CAMP)

by

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Introduction

The early years last a lifetime. Although this idea can be dismissed as an empty slogan, it is profoundly true. There is now an impressive body of research, from a wide range of fields, demonstrating the extent to which child development affects health, well-being, and competence across the balance of the life course. Over the past decade in Canada early child development has made the transition from being a purely private matter, of concern only to families, to an issue with a high public profile. This is because we now know that the determinants of success in early child development are to be found in the environments where children grow up, live, and learn. These environments, in turn, are strongly influenced by socioeconomic and civic conditions. Thus, society is implicated in early child development, whether it wants to address its role or not.

Society's influence on child development would not necessitate it becoming a public issue if its influence were random across the population, or uniformly beneficial. But, in Canadian society, as in most of the wealthy countries of the world, society's influence on child development is neither random nor uniformly beneficial. In Canada, inequalities in child development emerge in a systematic fashion over the first five years of life, according to well-recognized factors: family income, parental education, parenting style, neighbourhood safety and cohesion, neighbourhood socioeconomic differences, and access to quality child care and developmental opportunities. By age 5 a 'gradient' in early child development emerges, such that, as one goes from the families with the lowest to highest incomes; least to most parental education; and least to most nurturing and interactive parenting style, the average quality of early child experiences increases. This pattern is known as a gradient because it does not have a threshold. In other words, it is not just a question of poor children getting a 'bad deal' and the rest of our children 'being in the same boat.' Threats to healthy child development are found across the entire socioeconomic spectrum, though at increasing intensity as one goes from top to bottom. Thus, a concern for a good start in life is one that should unite families from all walks of life, and not separate the poor from the non-poor.

Family circumstances, moreover, do not operate on their own. Children who grow up in safe and cohesive neighbourhoods do better, on average, than those from dangerous and fragmented neighbourhoods. Similarly, vulnerable children who grow up in mixed income neighbourhoods tend to fare better than those that grow up in uniformly low income neighbourhoods. Finally, access to quality childcare and developmental environments, programs, and services; both those that include parents and those that do not, can and do make an important difference for Canadian children.

Canada has begun to address early child development as a public issue. A National Children's Agenda has been agreed to between the Federal and Provincial governments, and Federal-Provincial transfers have begun for the purpose on supporting new initiatives in early child development. Concurrent with these developments, a network of child development and population health researchers stepped forward to assist Canada and the provinces in measuring the state of development of its children. It was recognized that, despite our general knowledge of the determinants of early child development, we had no way of monitoring how those determinants played out in specific communities, or understanding how local circumstances could be changed to improve the life chances of children.

To fill this gap, a series of initiatives were developed between Human Resources Development Canada and academic research teams across the country. This report is the result of the initiative in the City of Vancouver. It presents a population-wide developmental assessment of kindergarten children in Vancouver using the EDI (described below), according to children's neighbourhood of residence. The neighbourhoods are then characterized in terms of their sociodemographic status; developmental risk circumstances; and *de facto* access to services and facilities that are meant to assist child development. What emerges is a comprehensive understanding of Vancouver as an environment for early child development, rich in insights as to what we, as a community, should address in order to improve the life chances of our youngest citizens.

Background on the Early Development Instrument (EDI)

The Early Development Instrument (EDI) was developed by Dr. Dan Offord and Magdelena Janus of McMaster University and is a checklist that teachers complete after having several months of classroom/school interactions with children in their class. The instrument is an age appropriate measure that looks at how ready kindergarten children are for school. In 1998/9 the EDI was normed on over 16,000 students nation-wide with validity and reliability studies occurring during the same time in Ontario and Calgary. Since 1999 it has been used in many communities across the country. A non-exhaustive list includes: Toronto, London, York, Ottawa, New Brunswick, Baffin Island, Vancouver, Fraser North, Squamish-Whistler, East Kootenays, South Okanagan, Port Alberni, Prince George, Chiliwack, Calgary, Prince Albert, Winnipeg, South West Newfoundland, Abbotsford, Montreal, Niagara Falls, South Eastman, Hampton, Saskatoon, and Prince Edward Island

The instrument is a group level measure. Although it is completed for each individual child, data can only be interpreted at a group level (ie. for a whole class, a whole school, or a whole neighbourhood) and is not meant to be used as an individual diagnostic tool. The purpose of the measure is to examine populations of children in different communities in order to help communities assess how well they are doing in supporting young children and their families. As well, the EDI can be used to monitor changes over time. All information is strictly confidential and is used solely for statistical purposes.

The EDI assesses five developmental domains, with results interpreted as follows:

Physical health and well-being

•above the 90th percentile, child is physically ready to tackle a new day at school, is generally independent, and has excellent motor skills.

•below the 10th percentile, a child with average or poor fine and gross motor skills, sometimes tired or hungry, usually clumsy, with flagging energy levels, and average overall physical development

Social competence

•above the 90th percentile, child never has a problem getting along, working, or playing with other children; is respectful to adults, self-confident, has no difficulty following class routines, and is capable of prosocial behavior

•below the 10th percentile, a child with poor overall social skills, with regular serious problems in more than one area of getting along with other children, accepting responsibility for own actions, following rules and class routines, respect for adults, children, and others property, with self-confidence, self-control, adjustment to change, usually unable to work independently.

Emotional maturity

•above the 90th percentile, a child who has almost never shown aggressive, anxious or impulsive behavior; has good ability to concentrate, and is often helping other children.

•below the 10th percentile, a child with regular problems managing aggressive behavior, prone to disobedience, and/or easily distractible, inattentive, impulsive, usually unable to show helping behavior towards other children, and who is sometimes upset when left by the caregiver.

Language and cognitive development

•above the 90th percentile, a child who is interested in books, reading and writing, and rudimentary math, capable of reading and writing simple sentences and complex words, able to count and recognize numbers and geometric shapes

•below the 10th percentile, a child with problems in both reading/writing and numeracy, unable to read and write simple words; uninterested in trying, and often unable to attach sounds to letters, has difficulty with remembering things, counting to 20, recognizing and comparing numbers, and is usually not interested in numbers.

Communication skills and general knowledge

•above the 90th percentile, a child who has excellent communication skills, can tell a story and communicate with both children and adults, has no problems with articulation; and English is this child's first language.

•below the 10th percentile, a child with poor communication skills and articulation, limited command of English, who has difficulties in talking to others, understanding and being understood, and has poor general knowledge[1].

In February 2000 the EDI was completed by all Kindergarten teachers in the Vancouver School Board on a total of 3,921 children. Results are presented here according to the community of residence of the child. They are reported as average developmental levels, as well as the proportion of "vulnerable" children; those who score on the lowest 10th percent in any one of the scales.

[1] Those interested in obtaining a copy of the Early Development Instrument should correspond with Dr Magdalena Janus, Centre for Studies of Children at Risk, McMaster University.

Results

A: Where do Vancouver Children Live?

This first set of maps serves to give an indication as to where young children reside and how the children sampled on the EDI readiness instrument are distributed throughout Vancouver's 23 neighborhoods.

Map A.1 shows the distribution of land use types in the City of Vancouver, showing that green space and commercial/industrial zones are mainly concentrated in several large blocks on the perimeter of the city, with many smaller areas interspersed with residential zones. Each red dot on the map represents the approximate residence of ten children aged 0-5 years. Map A.1 shows that the residential concentration of young children does not correspond to those neighbourhoods that are Vancouver's primary family neighbourhoods; those adjacent to parks and to significant amounts of green space on the west side of town. Because of housing prices, these areas have become sparsely populated with young children. Instead, young children are concentrated in those areas closest to the commercial districts and transportation zones in the central and eastern parts of town. In contrast, we have shown that the distribution of older children ((age six to nineteen) across town better fits the distribution of family neighbourhoods.

Map A.2 shows the distribution of the kindergarten children who were evaluated using the EDI, according to their neighbourhood of residence. The 23 neighbourhoods used here, and throughout this report, are the City of Vancouver planning neighbourhoods. Most, although not all, are natural neighbourhoods in the sense that people living within them would recognize their existence and 'distinct' character. Map A.2 clearly shows that the neighbourhoods with the greatest number of young children are located in specific areas on the east side of the city.

To those not familiar with Vancouver, this may seem at first a curious pattern pointing to issues one may not initially think about as being connected to child development. When

analyzed together with housing costs in the city, however, it becomes apparent that factors such as housing affordability, residential zoning density, and vacancy rates are separating families with young children from neighbourhoods designed for them. Instead of raising children in neighbourhoods with abundant green space and close to the best recreation opportunities and community centre facilities, parental choices are restricted to residences in high-density neighbourhoods near busy transportation corridors. Thus, the real estate market, the evolution of the city, and town planning are principal determinants of the local environments where young children grow up in Vancouver.

B: Neighbourhood Differences in Vancouver Children's School Readiness

The first five maps of this chapter show the proportion of children living in each neighbourhood that fell into the bottom 10% of scores on each of the developmental dimensions assessed on the Early Development Instrument (EDI). The bottom 10% is used here as a cut-off for vulnerability status, with those in the bottom 10% said to be "at risk" in terms of school readiness for the given developmental domain. If "all things were equal", 10% of children in each neighbourhood would fall into the vulnerable category but as demonstrated by the maps, this is not the case. The between-neighbourhood differences are in fact very large: for the language and cognitive development scale (Map B.1), 21% of children in the highest risk neighbourhood fell into the vulnerable category, while in the lowest risk neighbourhood, no children were identified as vulnerable; for physical health and well-being (Map B.2), the range was 0 – 22%; for social competence Map B.3), the range was 1 – 17%; for emotional maturity (Map B.4), the range was 2 – 16%; and for communication skills in English and general knowledge (Map B.5), the range was 0 – 16%. In other words, there are large and consistent differences in developmental vulnerability across Vancouver's neighbourhoods, with the greatest vulnerability being in the Strathcona, Mount Pleasant, and the Grandview-Woodlands neighbourhoods. (See Appendix D for a map of Vancouver with the names of the neighbourhoods included.)

The next five maps (Maps B.6 –B.10) show the neighbourhood average scores for the five scales of the EDI. These show a similar pattern, but with some important refinements. Those neighbourhoods that emerged with high average scores also had relatively low proportions of vulnerable children on the corresponding domain, as indicated by the previous set of maps. Stated otherwise, there are no neighbourhoods with high average scores that also had a high proportion of children in the vulnerable category. What this seems to indicate is that there is a very important aggregate component to children's development, such that neighbourhoods with high average levels of development buffer the developmental risks of those who are potentially vulnerable, and pull them along somehow. An analogy could be made here to the example of

cholesterol. If there is a high fraction of people who need to be treated for cholesterol in a community, one strategy is to target and treat them on an individual basis. An alternate approach would be to modify the overall food environment to the point at which the distribution of cholesterol in the population is shifted downward. In doing so, the fraction of people who are in the 'at risk' group automatically decreases. Bringing it back to child development, this suggests that having a positive and nurturing overall *climate* for development creates a buffering effect, as captured by maxim that "a rising tide raises all boats".

Consistent with the above, most of those neighbourhoods with low average developmental scores also have high proportions of vulnerable children. These may be thought of as the high risk neighbourhoods. However, there is an intermediate group of neighbourhoods with low average developmental scores that do *not* have high proportions of developmentally vulnerable children. This pattern suggests that these communities are somehow mitigating what otherwise might become developmental vulnerabilities. It is important for us to understand how this is taking place, with the purpose of spreading the lessons to the high risk neighboourhoods.

In the case of emotional maturity a distinct picture emerges. In terms of the proportion of emotionally vulnerable children, seven neighbourhoods fell into the highest or second-highest risk category. One of these was the West End (of downtown). Yet, this neighbourhood was in the TOP category in terms of its average emotional maturity. This indicates that, in this neighbourhood, there is a relatively high proportion of children who may be considered vulnerable, yet at the same time there is also a large number of children doing very well in terms of emotional maturity, with relatively fewer in the middle range of scores on this subscale. This pattern is clearly at variance with the generalities described earlier, and requires explanation[2].

[2] The explanation likely comes from the emerging work that has been done world-wide on the development of emotional resilience in children. This work shows that a minority of children who grow up in difficult circumstances come out better for it; having learned important life lessons from their experiences, rather than falling victim to them. Such children are considered 'resilient'. The factors that make for resilient children are

It is these patterns of neighbourhood variation in children's school readiness that represent the central set of observations that must be understood and explained. The patterns themselves are summarized in maps B.11, B.12 and B.13. Map B.11 shows the proportion of children living in each neighbourhood that were vulnerable on at least one subscale of the Early Development Instrument. As we can see from map B.11, between-neighbourhood differences are approximately six-fold, with a neighbourhood range of 6% - 38% in terms of the proportion of vulnerable children. This may be thought of as 'the difference that makes a difference.' The principal objective of bringing the issue of early child development into the public realm should be to reduce this gradient, such that, in 3 or 5 or 10 years time, repeat EDI assessments on kindergarten children will show much smaller neighbourhood differences, with large gains in the high risk neighbourhoods and smaller, though significant, gains in the lower risk neighbourhoods. Improvements in the high risk neighbourhoods will also lead to improvements in the low risk neigbourhoods.

Map B.12 removes the non-vulnerable children and shows the neighbourhood distribution of vulnerable children only. If one imagines the total number of vulnerable children in the City of Vancouver as being represented by a pie, this map indicates the size of the slice that would be found in each neighbourhood. Those neighbourhoods coloured in dark blue have the largest proportion of vulnerable children: between 13% and 16% of the entire pie. Those that are coloured red have the lowest: between 0% and 3%. It is important to notice that the blue neighbourhoods are *not* the highest risk neighbourhoods as shown by the previous maps. This is because the distribution of vulnerable children is determined *both* by the fraction of children in each neighbourhood who are vulnerable *and also* by the total number of children in the neighbourhood. Looking back at map A.2 shows that the dark blue neighbourhoods are those with the largest number of children. When these findings are brought together with those from the

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reasonably well understood. They include a strong sense of having social and emotional support; a confidence in being able to seek help in times of need (and knowing where and

next section, they tell a vitally important story: although the highest risk for vulnerability is in the least privileged neighbourhoods, the highest number of vulnerable children is spread (albeit more thinly) across the much larger middle class.

The latter point is reinforced by map B.13, which shows the average proportion of all *observations* on the children that are classified as vulnerable over all subscales of the Early Development Instrument. This is different from map B.11 in that it takes into account children that are vulnerable on more than one dimension of the EDI. As such, it is the most complete summary of developmental vulnerability by neighbourhood. The five neighbourhoods that have the greatest proportion of vulnerabilities are clustered in the centre-east portion of the city, corresponding to an area of greatest relative socio-economic disadvantage.

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how); and a well developed sense of personal efficacy. It is important for us to discover, through further research, whether or not resiliency can be taught to young children.

C: Socio-economic Characteristics that Affect Healthy Child Development

The collection of maps in this chapter describe the socioeconomic and demographic characteristics of Vancouver neighbourhoods, and together suggest a concentration of disadvantage in the north-central and east sides of town that is paralleled by developmental vulnerabilities in early childhood. The relative levels of disadvantage experienced in these neighbourhoods in terms of unemployment, low-income status, social assistance rates, low educational attainment and high rates of lone-parenthood, are reflected in the affordability constraints also faced by residents in terms of food and housing costs.

Map C.1 shows the proportion of low income families in Vancouver's neighbourhoods in the mid-1990s. It shows a five-fold increase (from ten to fifty percent) in the proportion of low income families; with the lowest proportion in the south west part of town, and the highest in the north central neighbourhoods. Map C.2 puts these differences in context, by showing the ratio of the cost of a nutritious food basket for a family of four as a proportion of the average income in each neighbourhood. In this case, the ratio of affordability increases six-fold across town; from eleven percent to sixty-six percent. Thus, in the neighbourhoods where there are a high proportion of people with low income, food affordability is a serious concern. As demonstrated in map C.2, food bank programs exist to mitigate some of these conditions for children and families, with those that serve the highest numbers of children located on the east side of town. However, compared with population size and the economic constraints faced by families living in these neighbourhoods, the total number of children being served by food banks is undoubtedly lower than the number experiencing food insecurity. While food bank services represent an important source of assistance for Vancouver families, it appears that many families use other alternatives to make ends meet.

Similarly, Map C.3 shows how the proportion of renters spending a large fraction of their income on rent increases in the same pattern across town. In terms of children's early development, economic constraints such as those faced by families barely able to afford

food and housing are undoubtedly constrained on their ability to provide a range of opportunities to support their childrens' development. Such constraints are reflected, indirectly, in many of the analyses throughout this report.

Maps C.4, C.5, and C.6 show that other demographic factors that may directly or indirectly influence child development, follow similar neighbourhood patterns as the economic variables. Map C.4 shows a ten-fold difference in the proportion of the adult population with less than secondary school graduation. This is important because parental education, especially that of the parent spending the most time with the child, influences early development. Although the basis of this effect is not well understood, it may operate through the educated parent's interaction with children, for example, through greater language fluency; the tendency to read to them on a consistent basis; the provision of stimulating activities; or through parental education helping them detect and address developmental difficulties in their children in a timely fashion.

Map C.5 shows the proportion of single parent families in each neighbourhood, ranging from eight to twenty-eight percent. Here, the concern is with the prospect that children in single parent families will, in general, be less affluent, be more socially isolated than those in two-parent families, and have only one adult available to model, as well as supervise,, behavioural development. Map C.6 shows the proportion of children in each nighbourhood who are growing up in single parent families on social assistance; in other words, where low income and a risk of social isolation coexist within the family. Here the neighbourhood contrast is very stark. Across the west side of town, relatively few children are growing up under these circumstances whereas in the north central parts of town approximately one-quarter of children are.

In addition to socio-economic disadvantage, one may intuitively regard immigrant status as a potential indicator for developmental risk, particularly in the area of English communication skills. However, the relationship is somewhat more complex. Neighbourhood differences in English communication skills (Maps B.5 and B.10) do not closely match neighbourhood differences in immigration from abroad (Map C.6). It

appears that English language skills are a function of *both* immigration and socio-economic status. Housing costs act in part as a socio-spatial sorting mechanism that differentially allocates immigrants into certain neighbourhoods. Given the housing affordability constraints faced by Vancouver residents, as reflected in the proportion of households spending more than 30% of their income on shelter costs, the income and employment characteristics that will permit entry into the city's housing market in most parts of town will entail English language capabilities or the economic means to acquire them. Immigrants with these advantages, in turn, tend to come from countries with relatively high levels of economic development. Thus, new immigrants to relatively affluent areas may arrive already equipped with English language capabilities that may then be fostered in their children, or the economic means to access language training or other resources that will facilitate developing linguistic competence in English. Meanwhile, in less well-off areas of town immigrants tend to come from societies where English is seldom used; tend to have their children taken care of by family members who do not have English fluency; and face economic barriers to accessing the resources that will facilitate developing English communication skills. This suggests that immigration status alone is not sufficient to explain neighbourhood differences in children's English language communication skills. Rather, it is a combination of immigration and socioeconomic factors that matter.

Similarly, the neighbourhood pattern of overall vulnerability does not match the distribution of the Aboriginal population in Vancouver neighbourhoods. It is true that there is a large off-reserve Aboriginal population in the three highest vulnerability neighbourhoods. But, at the same time, there is a large reserve community in the southwest corner of town (the Musqueam) where aboriginal children live in a neighbourhood that is among the lowest risk. Because we did not have an Aboriginal identifier on the Early Development Indicator at the time of the Vancouver assessment, we cannot say exactly what the relative contribution of Aboriginal children is to the EDI scores in each neighbourhood. Nonetheless, this work raises the prospect that Aboriginal children living in a relatively cohesive community with effective political and economic institutions and a high degree of cultural continuity, such as the Musqueam

community, may have a better start in life and more opportunities to become “resilient” than those who grow up in inner-city environments where these attributes may be lacking.

While it appears that patterns of increasing developmental risk closely match those of socioeconomic disadvantage, a close comparison reveals yet another important distinction. Several of the low risk neighbourhoods do have a considerable proportion of families whose sociodemographic characteristics should put their children at risk. However, in these neighbourhoods, which are generally affluent, family sociodemographic risks do not appear to translate into developmental risks to nearly the extent that they do in those neighbourhoods that are generally less affluent. In other words, in Vancouver, being a sociodemographically vulnerable child in a low developmental risk neighbourhood seems to be more advantageous than being a vulnerable child in a high risk neighbourhood. Another possibility is that, in the less affluent neighbourhoods, multiple risk factors concentrate within families. For instance, maps C.5 and C.6 indicate that high risk neighbourhoods are more likely to be characterised by families that are both on social assistance and led by a single parent, but single parent families that are also on social assistance are almost non-existent in the low risk neighbourhoods.

D: Neighbourhood Climate

Maps in this chapter describe neighbourhood climate, by which we mean stability, safety, degree of socioeconomic mixing and segregation, and the level of 'social capital' (here we have ratings of social trust, community participation, and trust in government). These measures are necessarily indirect, because the climate of Vancouver neighbourhoods for raising young children has never been directly assessed.

Map D.1 deals with the question of socioeconomic mixing versus segregation. It shows the distribution of non-market housing units in Vancouver, giving the total number of non-market housing units for families that may contain children (as opposed to those restricted to seniors, or one-bedroom units) in each neighbourhood. This map shows that there are virtually no non-market housing units for families throughout the southwest and south central part of town. Instead, they have been concentrated along the northern and eastern perimeters of town, and in the Fairview area. Thus, the majority of non-market housing for families in Vancouver has been built in existing low socioeconomic areas; effectively increasing the level of segregation in Vancouver neighbourhoods.

But a closer look reveals that non-market housing has actually been arranged in different ways in different neighbourhoods. In particular, in Fairview and Killarney, it has been mixed in with middle class housing by conscious design. A look at the EDI maps (especially summary map B.13) shows that Fairview and Killarney, despite high numbers of non-market dwellings, are not at high developmental risk whereas the downtown east side and surrounding areas (where non-market housing has contributed to ghettoization) are at high risk. This observation should lead to more careful scientific investigation of whether or not policies that create mixed neighbourhoods are helpful for child development[3].

[3] It should be noted that the planning principals that the City of Vancouver used in the development of the Champlain Heights neighbourhood are being applied by the City in

As an indirect measure of the climate of safety, map D.2 indicates the crime rate per capita by neighbourhood in the year 2000 and the type of crimes committed. Not surprisingly, the largest proportion of crimes committed are property-related, yet there are not only four-fold differences in aggregate crime rates by neighbourhood, but also variation in terms of the proportion of crimes that may be classified as violent. In the case of other criminal code offences, in most cases drug-related offences, east side neighbourhoods have higher rates of such offences than other neighbourhoods, as well as a greater proportion of violent crimes.

Maps D.3 and D.4 also speak to the safety and overall climate of Vancouver neighourhoods, referring to child protection investigations and rate of children's hospital admissions for injuries, respectively. In both cases, there are large neighbourhood variations. Map D.3 shows a greater than eighty-fold difference in the proportion of children whose families are investigated by the Ministry of Children and Family Development regarding child protection. The neighbourhoods with the highest investigation rates are also those with the highest crime rates. They are also those with the highest proportion of families that are clients of social services, and are thus 'known to the system'. Whether or not this latter factor influences the propensity for child investigations to be initiated, these data strongly suggest that levels of safety on the streets and behind closed doors are closely associated with one another. We would expect that their impact on child development to be, in some sense, cumulative.

Map D.4 shows fifteen-fold differences in hospital admission rates for injury across neighbourhoods. In this case, the neighbourhoods that have the highest rates are not the same as those that appear to be high risk on the other measures available to us. In one sense, this is fortunate, since it disrupts the pattern of consistency in risk across town. The basis for the variations seen in map D.4 is not easily explained and requires further study.

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the new neighbourhood developments on the north shore of False Creek and Coal Harbour inn the West End.

Map D.5 shows the incredibly high rate of residential transiency among children born in Vancouver. Here, Vancouver is divided into its six local health areas (LHAs). Using postal code information from the physician's notice of birth records held by the BC Linked Health Database, we placed each newborn in the city of Vancouver in 1991 into an LHA at birth. Then, using the linked data facility, we identified whether or not they were still in the LHA of birth at age nine. The results were stunning. Map D.5 shows that only 13.6% of children were still in their LHA of birth. In no neighbourhood were more that 19% still there. In other words, residential transiency seems to be an issue that cuts broadly across socioeconomic lines.

Most of the 86.4% of those who were not in their LHA of birth were no longer in the city of Vancouver at all. In addition to being socially disruptive, this level of transiency is a huge challenge for community development approaches to child development and to continuity of care for children with special needs. When children reach school age, it becomes a further challenge for educational momentum and continuity. In Vancouver's inner city schools, it is not uncommon for 50 percent or more of children to move during a given school year. This pattern is indicative of a level of housing insecurity that leads both to increased community instability and family disruption. Increasing family residential mobility has been associated with higher levels of behavioural vulnerability in middle childhood. It is reasonable to infer that the high rates of residential transiency in inner city neighbourhoods complicate efforts to build social cohesion that impacts children in those areas.

Direct evidence of the level of social cohesion in neighbourhoods is difficult to find, since it is usually based on surveys of residents rather than routinely-collected data. Accordingly, we do not have data, by neighbourhood, on social cohesion with respect to children. Instead, we have access to data on aspects of 'social capital' from the Canadian 2000/2001 Equity, Security, Community (ESC) survey. This survey included 162 randomly sampled adults (aged 18 and over) from the City of Vancouver who fully answered the relevant items on the ESC questionnaire. Random sampling resulted in a distribution of respondents that did not easily fit our neighbourhood boundaries. Yet,

there was sufficient data to create five regions within the city that bare a rough resemblance to the neighbourhoods (maps D.6, D.7, and D.8): the West Side (region A), the Inner City (region B), the East End (region C), mid-town (region D), and the South East (region E).

Map D.6 gives ratings of social trust by the five regions identified above. Here, social trust relates to hypothetical questions as to whether or not the respondents trust neighbourhoods, persons working in their community, police officers and complete strangers to return a lost wallet. The patterns of trust on map D.6 do not match closely with the patterns of child development across town. When 'medium' and 'high' levels of trust are taken together, social trust seems to be greatest in certain working class neighbourhoods (regions C and D), but lowest in another working class region (region E). The most privileged area (region A) and the least privileged area (region B) fall in the middle and are very similar to one another in levels of social trust. Map D.7 shows exactly the same rank ordering of the level of participation in community activities: service clubs, groups for children, cultural and political organizations, sports clubs, and/or health/social service volunteering. Map D.8 gives levels of trust in the federal and provincial governments. The responses here are more difficult to interpret. Once again, regions C and D have the largest proportion of respondents with high levels of trust in government and region E has the least. However, in this case the inner-city region B differs from previous. It has a low proportion of respondents with high levels of trust but a very large proportion with moderate levels of trust. There is little variation across the regions in terms of the lowest level of government trust.

In summary, those neighbourhoods with high crime rates, a high rate of child protection investigations, and large tracts of non-market housing in existing low socioeconomic neighbourhoods closely parallel one another and parallel the patterns of increasing childhood developmental risk. In contrast, neighbourhoods with high levels of non-market housing mixed in with middle class housing do not seem to be at high developmental risk. In contrast, high levels of residential transiency cut broadly across the socioeconomic spectrum. The data on social capital should be interpreted with

caution. The samples by neighbourhood are small and no attempt has been made to subject these data to rigorous statistical analysis. Nonetheless, these data do make clear that the level of social capital *does not* follow neighbourhood socioeconomic gradients across town. This would seem to suggest that relatively high levels of social capital are a resource for Vancouver's inner city and working class neighbourhoods, and could be enlisted in activities to compensate for their lack of socioeconomic privilege.

E: Early Health Risks, Timely Detection and Intervention

This section describes the geographical locations of children with health risks as well as the differences in resources available for identification, diagnosis, and intervention efforts.

Map E.1 shows the proportion of children born small for gestational age (SGA) in Vancouver. SGA was selected for display here, because it was an easily available measure, commonly occurring, and a valid predictor of developmental risk. Small for gestational age can be interpreted as a measure of how 'hospitable' the environment of the womb is for the development of the child. SGA children are more likely than normal for gestational age children to have a variety of developmental vulnerabilities: physical, cognitive, social, and emotional. Map E.1 shows a greater than five-fold gradient of SGA across Vancouver neighbourhoods (from 3.5% to 18.8%), with the highest risk neighbourhood being Strathcona.

Map E.2 shows the amount of Medical Services Plan dollars being spent on children in Vancouver during their first year of life. It shows that the lowest amount of money was spent on children in the Strathcona and in the neighbourhood adjacent to the University of British Columbia. Since SGA is a clear physical marker for a variety of conditions that ought to attract medical attention, this pattern is a matter for concern. It makes sense that health spending would be lower in areas with low rates of SGA (such as at UBC) but not in areas where nearly one child in five is born SGA. The issue raised by these data is whether or not universal access services, such as medical care, still carry non-financial barriers of access when the onus is on parents to seek care for their children.

Map E.3 addresses the issue of the effectiveness of active case-finding approaches to preventing developmental vulnerability. It shows the birth weight experience of children born to mothers in the Healthiest Babies Possible program of the (former) Vancouver-Richmond Health Board. This program combines resources from Federal (Canada

Perinatal Nutrition Program) and Provincial (Pregnancy Outreach Program) sources to provide social and nutritional support for women who are at socioeconomic risk during pregnancy. The program involves an active case-finding approach and approximately 97% of the women who enter the program have incomes that put them below the Low Income Cut-off for poverty in Vancouver. A statistical analysis (not presented here) demonstrated that the average birth weights and the proportion of low birth weight babies were similar to Vancouver as a whole, after adjustment for neighbourhood of residence. This strongly suggests that the active case-finding approach has had a positive impact on the rate of adverse pregnancy outcome for those mothers at highest risk.

Healthiest Babies Possible is not the only example of a program that can overcome the non-financial barriers of access to timely developmental services that emerge as one looks down the socioeconomic spectrum. Map E.4 shows the ratio of active Infant Development Program clients to clients on the waiting list, by neighbourhood in Vancouver. The IDP provides stimulation and support to a wide variety of children at developmental risk from biological or social causes. Map E.4 shows that the waiting lists are longer for children from privileged neighbourhoods. Of more concern here is whether or not the waiting times for access to IDP services reduces their timeliness and effectiveness in compensating for developmental vulnerabilities.

Map E.5 highlights the degree to which non-financial factors may affect access to passively delivered developmental services. The pie charts in each neighbourhood are coloured to show the relative proportion of referrals, from different sources, to the Vancouver-Richmond Health Board speech and language services for children 0-5. In the southwestern parts of town, up to half of all referrals come directly from the family (purple portion of the circle). In the inner city areas, a much smaller fraction of referrals come from the family. Here, children are most often being referred by health professionals, non-parental caregivers, program providers, or child welfare agencies, with an average of about one-quarter of children being referred by a parent or other family member. This map shows that there are important socioeconomic differences in the degree to which families, versus schools/care centers and other community agencies,

serve as developmental agents for the child. In the more privileged neighbourhoods, families are usually the developmental agents of first resort whereas in the less privileged neighbourhoods it is often the schools and child care centers that are the agents of first resort.

Maps E.6, E.7, and E.8 show the proportion of Kindergarten children tested, by school for vision problems, hearing problems, and nursing bottle tooth decay, who were found to have a problem requiring further evaluation or treatment. A similar picture emerges across all maps; there is a large range in the rates of problems previously unidentified and/or unattended to, with up to twenty-fold differences in detection rates by school. Once again, these differences follow a rising gradient across town from southwest to the inner city neighbourhoods of the north central/north east. Were we to look at these data in isolation from the rest of the information presented, one might conclude that programs in the inner city areas were more effective than in other areas. However, in light of other information already gathered, it is recognized that, in the south west side of town, problems such as tooth decay, hearing loss, and vision problems tend to be identified by families and addressed in appropriate ways prior to children's arrival at Kindergarten. In the inner city areas, this is less likely. This reinforces the perceptions based upon Map E.5: that schools and care centers play a key role as the developmental agents of first resort for many Vancouver children.

F: Childcare, Early Literacy and Parenting Programs

The section presents information on the availability and impact of participating in various preschool, child oriented programs in some cases with and in others without parent participation. Regardless, parents are largely responsible for locating these, identifying suitability, and ensuring child participation.

Figure F.1 is based on an analysis of data from cycle 1 and 2 of the National Longitudinal Survey of Children and Youth in Canada. It compares children who attended licensed childcare in their preschool years, with children who did not, by their teacher's rating of academic skills when they were in their first few years of school. The information is further subdivided according to the educational level of the child's mother. The figure shows that involvement in licensed childcare seems to be associated with improved academic skills for those children whose mothers have less than university educations, but no differences for those children whose mothers have a university degree or college diploma. In other words, the effectiveness of childcare as a developmental intervention is larger for children whose parents have lower levels of education.

It should be noted that there is no direct measure of the quality of care in this analysis. In other words, the results apply generally to licensed childcare programs as they are currently delivered in Canada, not just to exemplary programs. This is not to say that all licensed childcare centers confer developmental benefits to children. Instead, it means that, when the varying quality of licensed care is considered, Canadian licensed childcare in its current form is still of developmental benefit to those attending, subject to the caveat regarding mother's level of education.

Map F.2 shows the locations of licensed childcare and preschools around Vancouver and the degree of accessibility to licensed care spaces by neighbourhood. Accessibility is defined here as the number of spaces available per child under the age of 6. The map shows that there is a 10-fold difference in neighbourhood childcare accessibility rates across the city. In the best-served area there are 0.89 slots per child whereas in the least

well-served area there are only 0.09 slots per child. The least served areas are found, predominantly, in the working class areas of the east side. However, this distribution raises further questions: are childcare centres concentrated in business/commercial districts near parents' places of work, and is this a reflection of parental preference, or is there really less access to care?

Map F.3 shows the total value of provincial government childcare subsidies per child 0 – 5 that went to families in each neighbourhood for the year September 1999 to August 2000. Given that subsidies are means-tested, it is not surprising that subsidy amounts were much higher in lower income neighbourhoods than in upper income areas. However, the total value of the subsidies is nowhere equal to the cost of universal provision of childcare. They range from a low of $56 per child in the least subsidized neighbourhood to a high of $838 per child in the most heavily subsidized neighbourhood. In contrast, the grant to the public school system in Vancouver is approximately $6000 per child. Recently, attempts have been made to account for all the spending on children 0-5 in BC that was 'analogous to education'; before the Federal transfer payments for ECD began. The total came to approximately $1000 per child, and is heavily weighted towards spending on special needs children. Thus, our current spending on child development in the 0-5 age range is less than one-fifth what it is starting at school age.

One notable feature of the BC subsidy program has been that money has 'followed the child' rather than gone directly as a grant to the care centre. Thus, parents have been free to use the subsidy for centre-based care, licensed family care, or for unlicensed arrangements. Map F.3 overlays pie charts upon the subsidy rate information, showing the relative amounts of subsidy going to different forms of care in each neighbourhood. The striking finding is the degree of variation across the city. On the west side, in the university areas, and the most heavily subsidized areas, centre-based care receives a comparatively high share of the subsidy. However, on the east side of town, family and informal care arrangements receive a much higher share of subsidies. There are likely two reasons for this. First, access to licensed care is very low in these areas, as mentioned earlier. Second, since the subsidy rarely covers the full cost of care, those

receiving partial subsidies find it less financially onerous to put their children in less expensive forms of care.

These assertions are supported by Map F.4, which shows that in these same areas, more hours of unpaid child care are being provided than in the rest of town. *Furthermore, a look back at Map C.4 shows that the areas with the lowest access to licensed childcare are the areas with the lowest levels of education among the adult population.* Thus, there is the least access to childcare in the areas of town where it would likely have the greatest developmental benefits. Taken together, these findings suggest that there are significant barriers for families living in certain neighbourhoods, particularly in working class areas, in accessing the forms of care for their children that may improve developmental outcomes.

What are the benefits of the wide range of early literacy, parenting, and drop-in programs for children 0-5, other than licensed childcare? Figure F.5 repeats the analysis shown in Figure F.1; this time considering access to the full range of preschool programs other than childcare. Here, the Figure shows developmental benefits across the maternal educational spectrum, although of a slightly more modest degree than for childcare. Like the analysis of childcare, this includes programs such as family literacy and 'mom and tot', not just those with demonstrated effectiveness in improving one or more dimension of child development. In other words, it implies that, on average, Canadian children who participate in early preschool programs that fall into this category enjoy benefits compared to those who have not.

One agency that delivers such programs is the Vancouver Public Library. Map F.6 shows that Vancouver's local public libraries are well placed around town. It also shows the rates of circulation of books meant for children under 5 years of age, according to the catchment populations for each library. Here, we see a 20-fold difference in the rates of circulation of books for young children, suggesting that some libraries are well used while others are very much less used as resources for child development. In this case the most well used libraries are those in the south central parts of town where the librarians

have worked hard to build relationships with the local schools. (It should be noted that no data were available on picture book circulation rates for the library in Strathcona.) Sociodemographic factors need not create decisive barriers when it comes to access to useful programs for children. Map F.7 shows the level of neighbourhood attendance at the libraries' story-hour programs for young children. Here the library with, by far, the highest attendance is the Strathcona Public Library in the Downtown Eastside (Strathcona). This library, which is directly attached to the elementary school, recognized that parents in the area were likely to be 'non-readers'. Therefore, they turned their story hour into an outreach program; taking stories to childcare centers and drop-in programs, as well as taking referrals from the health Department. This success in breaking down 'non-financial barriers of access' to a program for early child development in an under-privileged neighbourhood is exemplary, and the lessons from it need to be learned and replicated in other sectors concerned with child development.

In addition to the Vancouver Public Library, there is a wide range of programs for child development that are funded by Federal, provincial, local, and philanthropic sources. These include: the Home Instruction Program for Parents and Youth (HIPPY), Aboriginal Head Start, Mother Goose, Nobody's Perfect, Building Blocks, Community Action Programs for Children (CAP-C), and a variety of programs put on by Family Places and Literacy BC. The locations of these programs are given on Map F.8. For many of these programs we were not able to get accurate, stable attendance figures or to define the size of the catchment population they are intended to serve. Nor can we say for certain that we have identified all the programs that belong in this category. For instance, the parks and recreation facilities have programs that contribute to the physical development of children, such as mom and tot swimming programs, but we were unable to obtain adequate information to map these programs. In general, the family strengthening programs have unstable funding bases and, as a result, may be quite temporary.

Map F.9 shows the capacities of several programs for which attendance figures were available: CAP-C, HIPPY, Building Blocks, and Teen Parenting Programs. We can see from Map F.9 that there is considerable variation in the five CAP-C coalitions in

Vancouver in terms of their target population, whether parents or children, yet at the same time all of the coalitions and partner agencies are located in and around the Downtown Eastside. This is generally the case for other programs such as Family Resource Centres, Nobody's Perfect, Mother Goose, and other family literacy programs, although many do maintain a presence elsewhere in the city. While this is unequivocally an area of great need in Vancouver, there are nonetheless other neighbourhoods in the city with considerable rates of childhood developmental risk that continue to remain underserved by such programs. Finally, Map F.10 shows the location and capacity of programs designed specifically to provide social support and literacy for immigrant families with young children.

Although Vancouver's family strengthening programs are likely providing strong developmental support to the clients they serve, it is currently impossible to carry out a population-based analysis of the capacity, location, and character of the available programs with respect to the developmental needs of Vancouver children.

G. School Success and Early Child Development

Starting in the school year 1999/2000 BC has implemented a program of standardized testing of mathematics, reading, writing, and other academic skills at Grade 4, 7, and 10, known as the Foundation Skills Assessment (FSA) tests. School data is publicly reported in terms of the proportion of children, by school that are 'meeting expectations', 'exceeding expectations', and 'failing to meet expectations'. Maps G.1-G.4 show Vancouver schools' Grade 4 reading and math results for 1999/2000 and 2000/2001, according to the proportion of children 'failing to meet expectations'. In each year the variation in the proportion failing to meet expectations was huge, from less than 10% in some schools to more than 50% in others. *Most important, the schools with high proportions of children failing to meet expectations were in the neighbourhoods where a high proportion of the children were developmentally vulnerable in kindergarten.* In other words, school success is closely tied to early child development, as one would expect.

Because of this, we reorganized our EDI developmental data according to school, and completed the following four sets of statistical comparisons, using linear regression methods, based upon the school as the unit of analysis.

- % of children in a given school 'failing to meet math expectations' in Grade 4 (for 1999/2000 and separately for 2000/2001) versus the proportion of vulnerable children in Kindergarten in 2000 according to our EDI assessment.
- % of children in a given school 'failing to meet reading expectations' in Grade 4 (for 1999/2000 and separately for 2000/2001) versus the proportion of vulnerable children in Kindergarten in 2000 according to our EDI assessment.
- % of children in a given school 'failing to meet math expectations' in Grade 4 (for 1999/2000 and separately for 2000/2001) versus the socioeconomic status of the school catchment area.
- % of children in a given school 'failing to meet math expectations' in Grade 4 (for 1999/2000 and separately for 2000/2001) versus the socioeconomic status of the school catchment

For each regression we identified the 5% of schools that fell the furthest above or below the 'best fit' line. These were then identified as the schools that most 'exceeded' or most 'fell short' of the norm *after taking into account the developmental vulnerability of children coming into the school or the socioeconomic character of the neighbourhood*. Thus, schools could exceed the norm on anywhere from zero to four analyses for each of the two years where we had FSA data or, conversely, fall short on zero to four analyses.

Map G.5 shows the summary results of this exercise. Red dot schools are ones that fell into the 'top 5%' category on at least one of four comparisons each year, and never fell in the 'bottom 5%' on any comparison. Pink dot schools fell into the 'top 5%' category at least once, but only in one year. Gray dot schools were primarily those that fell in the middle category in all four analyses for each year (however, three schools that had one comparison in the 'top 5%' category one year and the 'bottom 5%' category the next were included here). Light blue dot schools fell into the 'top 5%' category at least once, but only in one year. Dark blue dot schools fell into the 'bottom 5%' category on at least one of four comparisons each year, and never fell in the 'top 5%' on any comparison. Thus, red dot schools are the ones that consistently exceeded expectations after taking into account early development and socioeconomic factors and the dark blue dot schools consistently failed to meet expectations after consideration of these factors.

When the data are analyzed this way the pattern of success no longer follows the socioeconomic contours across town. Schools that tended to exceed the norm are *not* necessarily the schools with the lowest proportion of individual children failing to meet expectations on the FSA's. In fact, most of the west side schools that have relatively low proportions of children failing to meet expectations, end up as gray dot schools; falling within the norm on virtually all analyses. Most of the schools that either consistently exceed the norm or fall short were in the lower socioeconomic neighbourhoods with high rates of developmental vulnerability. In other words, virtually all the *variability* in 'school success' is found at the lower end of the socioeconomic spectrum. This has a straightforward meaning: the role of schools as agents of child development increases

dramatically as one goes from privileged to under-privileged areas. This is consistent with previous maps that showed the importance of community resources such as schools and care centers as the developmental agents of first resort for many Vancouver children.

Finally, our analyses show that the FSA data speaks to the schools' contribution to development of academic competence only after carefully taking into account early child development and socioeconomic factors.

From Mapping to Policy and Community Development

The purpose of this exercise was not to create 'original' research output of interest primarily to scholars. Instead, its purpose was to exploit existing knowledge about early child development and its determinants to measure the state of development of Vancouver's children; the resources available to assist them and their families in successful early development; and the opportunities and constraints young children face in growing up in different neighbourhoods in Vancouver. The resulting maps are publicly available and may be interpreted in a variety of ways. The reader is invited to use them liberally in support of activities that assist in early child development. Below are a series of interpretations place upon the maps by the Community Asset Mapping Program team. They are offered as assistance to the policy process broadly conceived and to those engaged in program and community development for young children.

• Developmental vulnerability follows a gradient across town, such that, as one goes from the most affluent to the least affluent neighbourhoods in town, the proportion of children who are vulnerable on at least one dimension of the EDI rises from 6% to 38%. As the risk of vulnerability rises, so does the frequency of complex vulnerabilities that cut across more than one of the five dimensions of the EDI. Although the highest risk of vulnerability is found in the poorest neighbourhoods of town, the largest number of children at risk is found more thinly spread across the middle class neighbourhoods that, taken as a whole, have a much larger number of young children than the poorest neighbourhoods. If the purpose of an early child development strategy is to increase resilience, decrease vulnerability, and reduce social inequality, then a strategy to provide universal access to the conditions that support healthy child development is needed. This may mean addressing issues in different ways in different neighbourhoods, but it does *not* mean focusing exclusively on the highest risk areas. Such a strategy would miss most of the vulnerable children in Vancouver.

• It would be quite reasonable to use the EDI data as a baseline from which targets can be set in fulfillment of an early child development strategy. For instance, the neighbourhood

gradient in vulnerability currently ranges from 6% to 38% across town. Within five years of the introduction of an effective early child development system (*i.e.* increased availability and accessibility of licensed care and preschool programs, more comprehensive outreach, higher coverage of early intervention programs, improved neighbourhood planning) one might expect to reduce overall vulnerability and compress inequality such that the neighbourhood gradient declined to (for instance) 4% to 15%. In other words, to plan for modest risk reductions in low risk areas and larger risk reductions in high risk areas.

• It is clear from the Community Asset Mapping Project that creating the conditions for healthy child development will require a profound degree of inter-sectoral collaboration. The programs, services, and environmental influences on children's development involve all three levels of government as well as philanthropic, business, neighbourhood, and family activities. Some factors, such as how the housing market affects the neighbourhoods that children grow up in, are rarely thought about in this context. Decisions made in one sector can have a profound effect on the effectiveness of other sectors in assisting in child development. For instance, if a regional health authority decides to eliminate kindergarten screening for hearing, vision, and/or dental problems it may do so on the understanding that such services are not central to their mandate of patient care. However, the repercussions for the school system, and for the long-term health, well-being, and competence of the children affected may be significant. At present we have no mechanisms to make sure that early child development does not 'fall through the cracks' as an inter-sectoral issue that belongs to everyone and no-one at the same time. Similarly, barriers between the three levels of government need to be conscientiously addressed and cooperation sustained over the long-term, in order to make progress on early child development.

• Perhaps the most important of the inter-sectoral challenges concerns the education system. At present, schools are society's principal child development agencies. However, school mandates do not start at birth and the notion of 'education' is often interpreted much more narrowly than 'development'. At the same time, the process of

early child development determines school readiness; and school readiness, in turn, plays a huge role in determining what can be achieved during the school years. In Vancouver, wonderful examples of school-community partnerships regarding family literacy and the use of schools as community facilities can be found. These are an important starting point for a form of inter-sectoral collaboration that needs to be taken much further over time.

• At the level of the urban environment there are two principal challenges that, if addressed, could make an important difference for child development in Vancouver. The first of these is neighbourhood socioeconomic mix. Like most major Canadian cities, Vancouver's neighhbourhoods are gradually becoming more economically stratified. This trend, if unabated, would likely have negative long-term consequences for early child development. However, Vancouver is also a showpiece for urban forms that support early child development. Our data suggest that the Fairview and Killarney neighbourhoods are examples of this, and it is clear that the principles that were applied in those developments are being applied in the new developments on the north shore of False Creek and Coal Harbour (located in the Central Business District neighbourhood). These initiatives are to be applauded. The current challenge is to spread the process of neighbourhood socio-economic integration to areas of town other than those where *de novo* developments are occurring.

• The second major challenge relating to urban form is residential transiency. We have documented the high levels of residential mobility seen among children born in Vancouver. Analyses of the National Longitudinal Survey of Children and Youth show that frequent moves are disruptive to both cognitive and social development. Moreover, if neighbourhood turnover of children is high, this undermines community cohesion as well as community development strategies, and complicates the mandate of schools. When moves are for reasons of occupational mobility, it is difficult to see what can be done. But when frequent moves are motivated by housing inadequacy or affordability, or to the undesirability of neighbourhood environments, they can and should be addressed through housing and community development strategies. Furthermore, the implications

of transiency are that any community development strategy needs to be accompanied by a 'life course' strategy. In other words, methods need to be developed to ensure continuity of opportunities for healthy child development wherever a child goes, much like the ongoing immunization record that follows the child.

• One of the most consistent findings from CAMP is the role of 'non-financial barriers to access' to programs and services that might assist early child development. These barriers are clearly more significant in lower, than higher, socioeconomic neighbourhoods. The central implication is that, as one goes down the socioeconomic spectrum, many developmental issues are not identified and addressed until later in childhood. In general, when it comes to child development, the earlier a problem is identified and addressed, the better. We do not have a thorough understanding of these barriers, although from *ad hoc* and indirect sources the following factors seem to be at issue: varying levels of parental consciousness of early child development, what constitutes a problem or developmental opportunity, and what should be done about it; work-life, home-life time conflicts that make it hard to access services and programs at the times they are offered; transportation and local access constraints; and language barriers and feelings of illegitimacy in the face of middle class professionals. At the same time, it is clear that such barriers can be broken down through active models like the Healthiest Babies Possible program and the Strathcona Public Library's Pre-school Program. A thorough analysis of 'non-financial barriers to access' would help determine when program-specific efforts to get programs to children would help; when parental education may help; when improved programs of home visiting and family advocacy might help; and when other broader policy issues (such as work-life, home-life leave provisions) are at issue.

• Through the Community Asset Mapping Program we have tried to provide as complete a picture as possible of the location, nature, and capacity of childcare and family strengthening programs in Vancouver. Although Vancouver has a rich variety of centers and programs, it is clear that funding levels are low, programs are unstable, neighbourhood accessibility is variable, capacities and population coverage are often

impossible to determine, the mix of programs is *ad hoc*, and evidence of program efficacy is largely absent. Yet, these are the programs that provide the bulk of the development opportunities for children aged 0-5 that are analogous to educational opportunities that start at age 6. This general set of problems has been recognized before and has been the subject of reports in Vancouver, BC, and other localities across the country. In most cases, a model of neighbourhood access to a comprehensive range of programs, encompassing childcare, parenting, family literacy, and special developmental services emerges. The results of the Community Asset Mapping Program strongly suggest that the time has come to start experimenting with such models on a much larger scale than in the past.

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Appendix A: Mapping Methodology

A.1
The total number of dots shown is proportional to the total number of children living in that Enumeration Area/Census Tract/Neighbourhood. Each dot represents 10 children, and dots are randomly distributed within the EA/CT/Neighbourhood.

A.2
Data were obtained from the 2000 Kindergarten Survey. Postal code level data were grouped to the Census Enumeration Area and subsequently the neighbourhood level using the July 2001 Postal Code Conversion File (Statistics Canada and Canada Post, 2001).

B.1 – B.5
EDI Maps: Proportion of Students in the Bottom 10% per Neighbourhood
Data were obtained from the 2000 Kindergarten Survey. For each subscale of the EDI the cut-off at or below which 10 percent of students scored was established. Postal code level data were then grouped to the neighbourhood level, and the number of students in each neighbourhood at or below the 10^{th} percentile for each subscale of the EDI was calculated. This figure was divided by the total number of students tested in each neighbourhood to determine the proportion of students tested that fell into the bottom 10% per neighbourhood for each subscale of the EDI.

B.6 – B.10
EDI Maps: Average Subscale Scores
Data were obtained as above. Postal code level data were grouped to the neighbourhood level, and average neighbourhood scores calculated for each subscale of the EDI.

B.11
Data were obtained as above. For each subscale of the EDI the cut-off at or below which 10 percent of students scored was established. Postal code level data were grouped to the

neighbourhood level, and the number of students in each neighbourhood at or below the 10th percentile on one or more subscales was calculated. This figure was divided by the total number of students tested in each neighbourhood to determine the proportion of students tested that fell into the bottom 10% per neighbourhood for one or more subscales of the EDI.

B.12
Data were obtained from 2000 Kindergarten Survey. For each subscale of the EDI the cut-off at or below which 10 percent of students scored was established. Those students at or below the 10th percentile on one or more subscales were selected out at the postal code level and grouped to the neighbourhood level, and neighbourhoods classified in terms of the proportion of vulnerable students residing there.

B.13
Data were obtained as above. For each subscale of the EDI the cut-off at or below which 10 percent of students scored was established. Postal code level data were then grouped to the neighbourhood level, and the number of students in each neighbourhood at or below the 10th percentile for each subscale of the EDI was calculated. This figure was divided by the total number of students tested in each neighbourhood to determine the proportion of students tested that fell into the bottom 10% in each neighbourhood for each subscale of the EDI. An average was then taken of the proportion of students in the bottom 10% per neighbourhood over all subscales.

Maps C.1 – C.7
Data were obtained at the Census Enumeration Area level from the 1996 Census and grouped to the neighbourhood level.

Map D.1
Data on social housing units for families and location of social housing projects were obtained from the City of Vancouver Housing Centre in December 2000, current as of August 2000.

Map D.2
Data on neighbourhood crime rates were obtained from the Vancouver Police Department in May 2001 for 2000. Data from some neighbourhoods were grouped to enhance reporting accuracy, and the numbers given represent approximate numbers and may not be said to constitute official statements on behalf of the Vancouver Police Department.

D.3
Data on child protection investigations were obtained at the postal code level from the Ministry for Children and Families (now Ministry for Children and Family Development) in February 2001. Data from years 1997-2000 were grouped to enhance reporting stability and preserve client confidentiality. Postal code level data were grouped to Census Enumeration Areas and thereafter to City of Vancouver Neighbourhoods. The

number of child investigations per capita (0-5) was derived by summing the total number of investigations for the period and dividing it by the total number of children 0-5 in that same neighbourhood.

D.4
Data on the rate of hospital admissions per 1,000 in years 1991-1997 for children born in 1991 were obtained from the BC Linked Health Database via the UBC Centre for Health Services and Policy Research at the neighbourhood level.

D.5
The proportion of infants born in Vancouver Local Health Areas in 1991 that continue to remain in their birth LHA's in 2000 was derived from anonymized, individual-level data on the LHA's of residence of BC MSP clients, updated yearly. LHA at birth was checked against LHA of residence for each consecutive year, to derive the proportion of infants born in 1991 that continued to reside in their birth LHA in 2000.

D.6 – D.8
The social trust, community participation, and government trust scales were based upon a factor analysis of the national sample of the Equity, Security, Community survey. The items selected by the factor analysis were then scored according to the ordinal response categories and divided into quartiles (lowest, low, medium, high) for analysis and display.

E.1, E.2
Data on the rate of small for gestational age births in 1996 and MSP dollars spent in the first year of life in 1996 for children born in 1991 were obtained from the BC Linked Health Database via the UBC Centre for Health Services and Policy Research at the neighbourhood level.

E.3
Anonymized, individual-level data on birthweights and postal codes of infants born to clients of Healthiest Babies Possible in years 1997-20001 were obtained from the (former) Vancouver-Richmond Health Board. Data on average neighbourhood birthweights were obtained from the BC Linked Health Database via the UBC Centre for Health Services and Policy Research at the neighbourhood level. Postal code level data on infants born to clients of Healthiest Babies Possible were then grouped to the neighbourhood and averaged, and divided by the average neighbourhood birthweight to derive a ratio of client birthweights to that of the general population.

E.4
Anonymized, individual-level data on postal codes and waiting list status of IDP clients as of May 02, 2001 were obtained from the Infant Development Programme in June, 2001. Postal code level data were grouped to the neighbourhood level, and the number of active clients divided by the number of waiting list clients to derive a neighbourhood ratio.

E.5
Anonymized, individual-level data on postal codes and referral sources for children referred to (former) Vancouver-Richmond Health Board Speech and Language Services in years 1994-2001 were obtained from VRHB in July, 2001. Postal code level data were then grouped to the neighbourhood level and classified proportionally by referral source by summing the total referrals from each source type per neighbourhood, and dividing by the total number of referrals per neighbourhood for all sources.

E.6, E.7, E.8
Data on Kindergarten screening for middle ear hearing loss, vision loss and nursing bottle tooth decay were obtained at the school level from the (former) Vancouver-Richmond Health Board in 2001.

F.2
Data on availability of daycares, preschools and family drop-in centres were obtained from West Coast Information Daycare, based on data current as of Summer, 2000. Total number of spaces per capita was determined by summing the total number of licensed care spaces in each Vancouver neighbourhood and dividing by the total number of children 0-5 in that same neighbourhood.

F.3
Data was obtained from BC Stats, 1996, and BC Ministry of Social Development and Economic Security, 2000. Cumulative child care subsidies per capita, per neighbourhood for children ages 0-5 obtained by calculating the total subsidies per neighbourhood and dividing by the total number of children, ages 0-5 per neighbourhood. The cumulative proportion of child care subsidies per neighbourhood, by type of care was determined by summing the total subsidies for each care type per neighbourhood, and dividing by the total subsidy amount per neighbourhood for all care types.

F.4
Data was obtained at the Census Enumeration Area level from the 1996 Census and grouped according to neighbourhood.

F.6, F.7
Data were obtained from the Vancouver Public Library Children's Services Statistical Report, 1998. For each library catchment area per capita values were determined by dividing the annual picture book circulation and preschool program attendance by the number of children 0-5 in library catchment areas.

F.8, F.9
Data on program locations and capacity were obtained from service providers and mapped by street location.

G.1 – G.4

Data on the proportion of students, by school, that scored below reading and numeracy expectations on the Grade 4 Foundations Skills Assessment in 1999-2000 and 2000-2001 was obtained from the Ministry of Education, with expectations standards determined by the Ministry. Data were mapped at the school level by location.

G.5

Linear regression analysis was used to predict the proportion of students that failed to meet expectations on the numeracy and reading subscales of Grade 4 Foundation Skills Assessment in 1999-2000 and 2000-2001, in relation to vulnerability the student population at school entry and the socio-economic status of the catchment area.

Data:

All data was obtained at the school level.

Independent Variables:

- **(i)** **School Readiness** at Kindergarten was measured by the proportion of students in each school that scored in the bottom 10% of scores on each of the five subcales (Physical Health and Well-Being, Social Competence, Emotional Maturity, Language and Cognitive Development and Communication Skills and General Knowledge) of the EDI in 2000.
- **(ii)** **Socio-Economic Status of the School Catchment Area** was defined as the unemployment rate, the proportion of adults 15 years and over with a post-secondary diploma, the proportion of economic families with incomes below $30, 000 and the proportion of households with English as their home language.

Dependent:

- **(i)** **Numeracy** was measured by the proportion of students that failed to meet Ministry-specified numeracy expectations on the Grade 4 Foundation Skills Assessment (1999-2000 and 2000-2001).
- **(ii)** **Reading** was measured by the proportion of students that failed to meet Ministry-specified reading expectations on the Grade 4 Foundation Skills Assessment (1999-2000 and 2000-2001).

Methods:

Four sets of statistical comparisons were completed for each year of the Foundation Skills Assessment (1999-2000 and 2000-2001), using linear regression analysis. Models were as follows:

(i) % of children in a given school “failing to meet numeracy expectations” in Grade 4 (1999-2000 and 2000-2001) versus the school readiness of Kindergarten children,

(ii) % of children in a given school "failing to meet reading expectations" in Grade 4 (1999-2000 and 2000-2001) versus the school readiness of Kindergarten children,

(iii) % of children in a given school "failing to meet math expectations" in Grade 4 (1999-2000 and 2000-2001) versus the socioeconomic status of the school catchment area,

(iv) % of children in a given school "failing to meet math expectations" in Grade 4 (1999-2000 and 2000-2001) versus the socioeconomic status of the school catchment area.

For each model the 10% of schools that fell furthest above or below the "best fit" line were identified, using the standardized residual coefficient. These schools were then identified as those that "most exceeded" or "fell most short" of expectations as determined by the developmental vulnerability of students at school entry and the socio-economic character of the neighbourhood. Schools were then classified as follows:

(i) **Red dot schools** "most exceeded" expectations on the Foundation Skills Assessment on at least one of the four models in both years,

(ii) **Pink dot schools** "most exceeded" expectations on the Foundation Skills Assessment on one of the four models in one year only,

(iii) **Grey dot schools** did mainly as expected on the Foundations Skills Assessment (*also includes 3 schools that both "most exceeded" and "fell most short" of expectations),

(iv) **Light blue dot schools** "fell most short" of expectations on the Foundation Skills on at least one of the four models in one year only,

(v) **Dark blue dot schools** "fell most short" of expectations on the Foundation Skills Assessment on at least one of the four models in both years.

Appendix B: GIS and CAMP

What is GIS?

- GIS, or Geographical Information Systems, are tools that can help us to analyze spatial phenomena, and are most commonly associated with maps.
- But GIS can do more than just make maps.
  - On paper maps, each color, pattern, picture or label gives information about the features it represents. But with paper maps, the amount of information you can get and the possibilities for analyzing are limited by what is shown and how.
  - GIS can help us to integrate and manage many different sources and types of spatial data, and to analyze them together in dynamic ways.
  - For example, we can analyze where preschool programs are located in relation to children under 5 in Vancouver neighbourhoods.
  - By doing this, GIS gives us capabilities to do much more sophisticated analyses than were possible from visual appraisal, and to analyze relationships among phenomena based on their location. This is the true power of GIS.

GIS and the UBC Community Asset Mapping Project (CAMP)

- In the Community Asset Mapping Project, GIS is being used to help us understand:
  - where children live in Vancouver;
  - the socio-economic characteristics of Vancouver neighbourhoods;
  - the availability of programs and resources for families and children;
  - and above all, in which neighbourhoods children are healthy and ready to learn when they start school, and in which neighbourhoods they are having problems.

CAMP: the maps and what they tell us

- CAMP maps fall into three broad categories: (i) Census DATA, (ii) EDI, (iii) programs and resources.

- MAPS BASED ON Census DATA were created to give us a sense of the socio-economic characteristics of Vancouver neighbourhoods.
  - Based on data from the 1996 Census and BC Stats, Census maps show such things as unemployment, home ownership, population mobility and single parent households. Most importantly, they tell us where children and families live in Vancouver.

- EDI maps tell us where children are doing well developmentally, and are healthy and ready to learn when they start school. They also tell us where children are

having problems in areas such as language and communication skills, cognitive development and social/emotional well-being.
    - For example, as we can see from the EDI maps there are more children in Strathcona, Grandview-Woodlands and the West End that are facing challenges in the area of physical health and well-being.
    - At a more general level, there is an east-west divide in terms of healthy developmental outcomes, with more children on the west side having healthy developmental outcomes

- Program and resource maps show us the location of various resources important to families and children, for example daycares, preschool programs, libraries and social housing.
- By using GIS, we were able to put these data sources together and get a more complete picture of how Vancouver is doing in terms of child outcomes, and providing adequate resources for families and children.

CAMP: the methodology

- Creation of the CAMP maps was conducted on a local-area basis, using the City of Vancouver's neighbourhood planning boundaries as a base.
    - There are 22 planning neighbourhoods in Vancouver, plus the UBC area.

- Much of the data that was used in CAMP came from the 1996 Census, or BC Stats. This data was available on a postal code or Census Enumeration Area basis, and so was aggregated up to the neighbourhood level.
    - Enumeration Areas are the smallest geographic unit for which Census data is available.

EDI data was collected in the Spring of 2000 in a survey of all five-year old children attending kindergarten in the Vancouver School Board, English Public Schools.

Appendix C: Children Designated as 'Special Needs'

Seventy-one children (1.8 percent of the total) were identified as special needs in Vancouver School Board kindergartens. These children were excluded from the analyses in the main body of the report, so as not to confound the neighbourhood differences due to social factors with risks from factors thought to be purely biological. Their outcomes are presented here. Seven of 23 neighbourhoods had no special needs children, one neighbourhood had ten, and the rest had between one and nine. As a group, the special needs children exhibited more vulnerabilities than non-special needs children on each of the scales, but *vulnerabilities were as strongly socially patterned for special needs children as they were for the non-special-needs children*. The table below shows large developmental advantages for the twelve special needs children from nine privileged neighbourhoods in Vancouver compared to the fifty-nine special needs children from the remaining fourteen less privileged neighbourhoods. This table, when compared to the maps of the non-special needs children, strongly suggests that the social environment influences the development of children with and without recognized disabilities to at least an equal degree.

Appendix Table C.1: Proportion of special needs children who scored in the vulnerable category, by scale and neighbourhood

Scale	Overall (n=71)	Privileged Neighbourhoods (n=12)	Non-privileged Neighbourhoods (n=59)
Physical health and well-being	55%	33%	59%
Social Competence	54%	33%	58%
Language and cognitive	54%	33%	56%
Emotional Development	44%	25%	47%
Communication skills & general knowledge	46%	17%	53%

Appendix D.1/City of Vancouver Neighbourhoods