

Poverty during pregnancy: Its effects on child health outcomes

Charles P Larson MD FRCPC^{1,2}

CP Larson. Poverty during pregnancy: Its effects on child health outcomes. *Paediatr Child Health* 2007;12(8):673-677.

It is estimated that nearly 100,000 children are born into poverty each year in Canada. During pregnancy, their mothers are likely to face multiple stressful life events, including lone-mother and teenage pregnancies, unemployment, more crowded or polluted physical environments, and far fewer resources to deal with these exposures. The early child health consequences of poverty and pregnancy are multiple, and often set a newborn child on a life-long course of disparities in health outcomes. Included are greatly increased risks for preterm birth, intrauterine growth restriction, and neonatal or infant death. Poverty has consistently been found to be a powerful determinant of delayed cognitive development and poor school performance. Behaviour problems among young children and adolescents are strongly associated with maternal poverty. Sound evidence in support of policies and programs to reduce these disparities among the poor, including the role of health practitioners, is difficult to find. This is partly because many interventions and programs targeting the poor are not properly evaluated or critically appraised.

Key Words: *Child health; Pregnancy; Poverty; Review; Social paediatrics*

The purpose of the present article is to provide an overview of what is known about the impact of poverty during pregnancy on subsequent child health outcomes and what can be done to reduce the disparities that continue to occur. This is not a systematic literature review; however, the paper will focus on published literature that links maternal poverty to child health outcomes in economically advantaged countries that can be extrapolated to the Canadian context. This includes peer-reviewed publications of studies performed in Canada and in other industrialized, developed countries, and also includes the 'grey' literature published by organizations that advocate for improved health among the poor. Plainly stated, it is clear from these readings that to be born into poverty is not good for a child's health. This is a well-established fact. To continue to experience poverty throughout childhood is even worse, with the health consequences for these children remaining with them for the duration of their lives (1-3).

La pauvreté pendant la grossesse : Ses effets sur la santé des enfants

On estime que près de 100 000 enfants naissent dans la pauvreté chaque année au Canada. Il est probable que leur mère assume seule leur maternité, qu'elle soit adolescente et que, pendant la grossesse, elle doit affronter de multiples autres événements stressants tels que le chômage, des milieux physiques plus surpeuplés ou plus pollués et des ressources beaucoup plus limitées pour faire face à ces situations. Les conséquences de la pauvreté sur la santé des jeunes enfants et sur la grossesse sont multiples et orientent souvent le nouveau-né vers un parcours de disparités en santé qui durera toute la vie. Soulignons des risques beaucoup plus élevés de prématurité, de retard de croissance intra-utérine et de mortinaissance ou de mort du nourrisson. La pauvreté a toujours été un puissant déterminant de retard de développement cognitif et de rendement scolaire médiocre. Les troubles de comportement chez les jeunes enfants et les adolescents sont fortement associés à la pauvreté de la mère. Il est difficile de trouver des données probantes pour étayer les politiques ou les programmes en vue de réduire ces disparités chez les personnes pauvres, y compris le rôle des dispensateurs de soins. Ce constat s'explique en partie par le fait que de nombreuses interventions et de nombreux programmes qui ciblent les personnes pauvres ne font pas l'objet de bonnes évaluations ou d'évaluations critiques.

While there exists widespread consensus regarding the detrimental impact of poverty or income disparities on health, there is considerable debate regarding the magnitude of and reasons for the impact (4,5).

Pregnancy and birth are the first of several definitive life events that shape health outcomes within the course of an individual's lifetime. With this in mind, the impact of poverty on pregnancy and subsequent child health needs to be placed within the context of the cumulative influence of multiple adverse exposures directly and indirectly experienced by those living in poverty, often from one generation to the next (6,7). This population health approach to conceptualizing the determinants of health, formulating health policies and developing interventions has its origins in the Lalonde report (8), published in Canada more than three decades ago. Subsequently refined by Evans and Stodart (9) and others, societal or individual health is viewed to be a consequence of multiple, interactive determinants,

¹Departments of Pediatrics and Epidemiology & Biostatistics, Faculty of Medicine, McGill University, Montreal, Quebec; ²The International Centre for Diarrheal Diseases Research, Dhaka, Bangladesh

Correspondence: Dr Charles Larson, The International Centre for Diarrheal Diseases Research, GPO 1000, Dhaka, Bangladesh 1000.

Telephone 880-2-9881760, e-mail clarson@icddr.org

Accepted for publication August 27, 2007

summarized within global (ie, physical, environmental and socioeconomic), middle-level (ie, health systems and behavioural interventions) and individual, household or community factors (ie, genetics, nutrition, behaviour, shelter and organizations). Some (10,11) have argued that the magnitude of the health impact of the above determinants of health is, in large part, a function of socioeconomic disparities that occur during developmentally sensitive periods of life, including pregnancy. Furthermore, what happens at the beginning of life can have long-term consequences well into adulthood and even intergenerationally (12,13). For example, it has been estimated (14) that childhood exposure to poverty doubles the risk of death by 55 years of age – a risk that increases to as much as fivefold if the exposure continues into young adulthood.

The present article was written in Dhaka, Bangladesh, where poverty 'hits you in the face'. Far from being hidden, families visibly struggle to live on daily incomes that would not buy a cup of coffee in Canada. For obvious reasons, colleagues in Bangladesh have difficulty grasping the idea that a Canadian family of four that earns \$25,000 per year is considered to be living in poverty. When defined in terms of absolute incomes, 'poverty' in Canada and in Bangladesh are clearly addressing very different phenomena. These huge income disparities highlight the shortcomings of absolute poverty figures and the need for people to not focus on a dollar income threshold, but preferably on inequalities in income, ie, 'relative poverty'. Whether in Bangladesh or Canada, people living in relative poverty share much in common. They are less educated, less able to cope with stressful life events, and have access to fewer resources when required. Among pregnant women, added to this are greater proportions of teenage or single-mother pregnancies, unemployment, higher levels of stress, and exposure to more crowded and polluted physical environments (4,7). In Canada, a mother who becomes single has a 50% chance of becoming poor within 12 months and has less than a 30% chance of her or her children escaping from it (15).

POVERTY AND PREGNANCY

Depending on how one defines poverty, between 50,000 and 100,000 children are born into poverty each year in Canada (16,17). It is estimated (16) that one in five, or approximately 1.4 million, Canadian children live in relative poverty. The ratio of highest to lowest income quintiles in Canada is approximately 10:1. This inequality in income has, at best, been static since the 1970s and some studies (18) indicate that the inequality is actually increasing. In 1973, the lowest quintile of the Canadian population held 5.3% of the total Canadian market income. This value dropped to 2.3% in 1996. Over the same period, among the highest income quintile, the percentage of the total Canadian market income rose from 38.4% to 43.2% (18). In terms of household cumulative wealth, as opposed to annual income earnings, the disparities are even greater, with the upper 10% of Canadians holding 54% of the wealth, while the lower 10% hold none, ie, they are in debt (19).

From a descriptive standpoint, what is known about women living in poverty and pregnancy? Poverty has been associated with increased total fertility rates, unintended or teenage pregnancy and being a single mother (20-22). In nearly all developed countries, youth living in poverty have a significant increase in risk for teenage pregnancy (22). In a recent Alberta survey (23), female teenagers living in poverty were found to have a five times greater risk for pregnancy. When compared with higher income women, those living in poverty were more likely to smoke, to have poorer dietary habits, lower levels of education, and engage in higher risk and health-demoting practices (4,24,25). Lower socioeconomic status in Canada and elsewhere is associated with decreased prenatal care attendance (4,26).

PREGNANCY, POVERTY AND CHILD HEALTH OUTCOMES

Infant mortality

Infant mortality rates among the poor fell by 14% in the 1990s; nevertheless, income disparities persist (16,27). Luo et al (28) compared birth and mortality outcomes, and trends in infant mortality from 1985 to 2000 among British Columbia neighbourhoods, stratified by income status. Differences were found to be limited to urban populations. Comparing highest with lowest income neighbourhoods, infant mortality rates were two-thirds higher in the latter (4.5 versus 7.5 deaths under 12 months of age per 1000 live births) and these disparities had not diminished over time. Disparities in postneonatal mortality over this period actually rose. Similarly, in an analysis of the Quebec birth registry from 1991 to 2000 (29), living in a low-income neighbourhood was found to be associated with an increased risk for neonatal and postneonatal death. The study also found a 30% increased risk for stillbirths among women living in the lowest income neighborhoods.

Preterm birth and intrauterine growth restriction

Preterm birth and intrauterine growth restriction have been consistently associated with lower socioeconomic status, in particular within poor urban populations in Canada (27-29). By combining both of these outcomes, Spencer et al (30) reviewed British birth registration low birth weight data. They estimated that 30% of low birth weights could be attributed to a mother's lower social class. Explanations for these disparities in birth outcomes include higher rates of maternal smoking, poorer nutrition and a higher prevalence of genitourinary tract infections among lower income pregnant women. Kramer et al (4) and Seguin et al (31) have hypothesized that premature birth and/or intrauterine growth restriction may, to a significant extent, be explained by the greater exposure of poor pregnant women to accumulated chronic stressors, including crowded home environments, unemployment, single-parent households, less social support and financial problems (4). Looking at this from a social and physical environment perspective, it is evident that children living in poverty also accumulate a wide range of adverse risk exposures that in their totality, as opposed to

a single risk factor, explain why childhood poverty is so pathogenic (31).

Unmet potential in cognitive development

Poverty has consistently been found to be a powerful determinant of delayed cognitive development and poor school performance. This has been demonstrated (2,7,32) to be largely mediated by the physical and social environment in which poor children live, maternal characteristics, the learning environment of the home and community organization characteristics. It is far from evident what, if any, proportion of the observed cognitive delays can be attributed to exposure to poverty during pregnancy. What is clear is that, following delivery, poverty leads to decreased resources, which in turn leads to a host of household inputs that influence child development. This includes decreased stimulation and book reading in the early years, less responsiveness for language development, less comfort with teachers and homework routines, decreased monitoring of child activities, and perhaps less value placed on education. These experiences, in turn, lead to poorer academic (not intellectual) performance and early school dropout (33). As previously cited, there is a well-established increased risk among lower income women for preterm birth and intrauterine growth restriction. These birth outcomes are important predictors of subsequent deficits in neurocognitive function, lower educational attainment and lower socioeconomic status (34,35).

Behaviour problems

Behaviour problems among young children and adolescents is strongly associated with maternal poverty, but interacts with several other characteristics found among women living in poverty. These characteristics include lower education, poorer maternal health, marital conflict, one-parent households and the greater likelihood of health risk behaviours such as smoking (36-38). These characteristics often occur together over several years, reflecting a mother's past childhood poverty and prepregnancy health (36). An intergenerational cohort study (12) of disadvantaged children with behaviour problems who were living in Montreal, Quebec, has provided important insights into the cyclical nature of poverty and behaviour problems. That cohort of low-income children with early childhood behaviour problems (aggression or social withdrawal) were more likely to adopt health-demoting practices and report poorer health as adolescents and young adults. This combination of low income status and poor health habits was associated with behaviour problems in adolescence, school dropout, early pregnancy, early marriage and mental health problems as parents. Several women in this cohort had children of their own. Their children have been found to have higher rates of reported common illnesses. They were also more likely to have been prescribed ritalin, in spite of no differences in attention deficit-hyperactivity disorder symptoms. This combination of poverty with behaviour problems, whether they are real or perceived, has followed individuals throughout their life, with transfer from one generation to the next.

TABLE 1
Health and social disparities by household income: Child outcomes from the 1994 cycle of the Canadian National Longitudinal Survey of Children and Youth

Outcome	Annual household income		
	<\$20,000, %	\$40-49,999, %	>\$80,000, %
Aggressive behaviour	38	28	25
Frequent delinquent behaviour	16	9	6
Emotional disorder and anxiety	12	8	7
Attention deficit-hyperactivity disorder	20	14	13
Functional health problem	14	8	5
Delayed vocabulary development	37	18	8
Receiving special education	10	5	5
Rarely participates in organized sports	73	57	29

Data from reference 39

Findings from this and other studies (12,13) suggest that a life-course approach to public health programs, targeting low-income women, holds the potential to reduce health disparities for them and their children. Table 1 summarizes income disparities for several health and social outcomes that affect Canadian children, as identified by the Canadian Longitudinal Survey of Children and Youth (39)

Preconception health

The link of preconception and adolescent health with pregnancy outcomes has, in particular, focused on nutritional exposures. Over the past decade it has become apparent that obesity is an important public health issue, with adverse health implications throughout the life cycle, including pregnancy. It is estimated that over 20% of Canadian women who are of reproductive age are obese (40). A recent Danish study (41) assessed the risk for adverse reproductive health outcomes among obese women. The study found that obese women had over two to three times the risk for stillbirth or neonatal death. From a public health standpoint, to deal with this issue will require that greater attention be given to preconception and, by extension, child nutrition. Childhood obesity is on the rise. By the end of primary school, the prevalence of childhood obesity is in excess of 10% of children and as high as 20% in lower income children (42). The majority of these children will remain obese through their teenage years and adulthood. The adverse reproductive health risks that can be attributed to preconception obesity are not well established and represent an important future research priority.

WHAT CAN BE DONE? INTERVENTIONS AND PROGRAMS

Interventions that target poor women either during pregnancy or soon after delivery have, at best, had a modest impact on maternal and child health outcomes. Both individual and population-based strategies have been tried.

The strategies include prenatal and/or postpartum home visiting (43-46) or early parent training (47), as well as population-based programs that provide community social support (48) or urban regeneration (49) strategies. From a life course perspective, prenatal home visiting would seem to be the logical place to begin. For nearly three decades, varied home visitation strategies have been tested in lower income populations. Combined with postpartum home visits, prenatal home visits have been demonstrated to have positive benefits on health services utilization and parenting behaviours (43,44,50), but have been of questionable benefit in terms of physical or mental health outcomes. More encouraging is the finding that postpartum educational visits with a paediatrician among low-income women can improve parenting skills, in particular among primiparous mothers (51). In terms of maternal health outcomes, perhaps the strongest evidence is in support of favourable mental health outcomes attributed to group parenting programs. Over the short term, these groups have been shown to reduce anxiety or depression and improve self-esteem (47). Social support interventions have not been found to be as effective, and they suffer from several programmatic challenges, such as reaching and maintaining contact with those facing the greatest accumulated stress and in greatest need (48). A relevant set of literature not included in the present review is the impact of daycare on health outcomes among low-income children.

Nearly all the intervention programs reviewed have been stand-alone efforts and period-specific. Life course strategies that combine the best informed interventions, beginning either before conception or early in pregnancy but that are linked to early childhood and adolescent health events, deserve greater funding and program support. Such initiatives should target lower income neighbourhoods, working with all, rather than specific, families. This needs to directly include recipients in the planning, conduct and monitoring of services. Ideally, given proof of effectiveness, acceptability and cost, this would lead to better informed public policies that aim to reduce income and health inequalities.

PROFESSIONAL ROLES

Paediatricians, obstetricians, family physicians and other child health professionals have an ethical and professional responsibility to maintain the health of children in the

populations they serve and in society more globally (51). This 'social contract' is at the heart of medical professionalism (52). Because poverty is a known, important determinant of maternal and child health, it begs the question, what are our roles and obligations? The pathways between poverty and health outcomes are not always clear and therefore professional roles become more obscure. This gap in understanding has recently been addressed by including 'social paediatrics' in paediatric training programs. This involves removing medical residents and other child health trainees from traditional clinical settings and providing community-based opportunities for more direct exposure to the social realities of poverty (53,54).

There are well-known, more proximal determinants of health that more commonly occur among lower income pregnant women, such as smoking or inadequate preparation for newborn and early infant care, that can be dealt with in clinical practice settings. Outside these settings, child health professionals can also play a role. Examples include becoming better informed of the evidence that links poverty to child health and using this knowledge to raise awareness in their communities and beyond. Locally, child health professionals can encourage and participate in community engagement with, and advocacy for, the poor through local and national nongovernment organizations. Those who teach or mentor health trainees have an opportunity to integrate their knowledge of social with physical and environmental determinants of health, thus encouraging a more holistic approach to disease prevention and curative care.

From a research standpoint, methodologically sound evidence in support of policies and programs that aim to reduce disparities in pregnancy outcomes, or, more generally, health among the poor is difficult to find (55). Many programs that target the poor are not properly evaluated and funding to support this is difficult to obtain. The prevailing attitude that 'we know what's wrong, now let's get on with it', fails to appreciate important gaps in knowledge that are required to guide the introduction of proven, effective interventions. These gaps can only be filled through continued funding support for formative and health systems research that provides the knowledge necessary for well-informed, pro-poor health policies and the widespread application of effective, affordable and acceptable interventions.

REFERENCES

- Brooks-Gunn J, Duncan GJ. The effects of poverty on children. *The Future of Children* 1997;7:55-71.
- Guo G, Harris KM. The mechanisms mediating the effects of poverty on children's intellectual development. *Demography* 2000;37:431-47.
- Seguin L, Nikiema B, Gauvin L, Zunzunegui MV, Xu Q. Duration of poverty and child health in the Quebec Longitudinal Study of Child Development: Longitudinal analysis of a birth cohort. *Pediatrics* 2007;119:e1063-70.
- Kramer MS, Seguin L, Lydon J, Goulet L. Socio-economic disparities in pregnancy outcome: Why do the poor fare so poorly? *Paediatr Perinat Epidemiol* 2000;14:194-210.
- Lynch JW, Kaplan GA, Salonen JT. Why do poor people behave poorly? Variation in adult health behaviours and psychosocial characteristics by stages of the socioeconomic lifecourse. *Soc Sci Med* 1997;44:809-19.
- Halfon N, Hochstein M. Life course health development: An integrated framework for developing health, policy, and research. *Milbank Quart* 2002;80:433-79.
- Evans GW. The environment of childhood poverty. *Am Psychol* 2004;59:77-92.
- Government of Canada. A new perspective on the health of Canadians (Lalonde Report). <http://www.hc-sc.gc.ca/hcs-sss/alt_formats/

- hpb-dgps/pdf/pubs/1974-lalonde/lalonde_e.pdf> (Version current at September 13, 2007).
9. Evans RG, Stodart GL. Producing health, consuming health care. *Soc Sci Med* 1990;31:1347-63.
 10. Hertzman C. The lifelong impact of childhood experiences: A population health perspective. *Daedalus* 1994;123:167-80.
 11. Keating DP, Hertzman C, eds. *Developmental Health and the Wealth of Nations: Social, Biological, and Educational Dynamics*. New York: Guilford Press, 1999.
 12. De Genna NM, Stack DM, Serbin LA, Ledingham JE, Schwartzman AE. From risky behavior to health risk: Continuity across two generations. *J Devel Behav Pediatr* 2006;27:297-309.
 13. Kahn RS, Wilson K, Wise PH. Intergenerational health disparities: Socioeconomic status, women's health conditions, and child behavior problems. *Public Health Rep* 2005;120:399-408.
 14. Kuh D, Hardy R, Langenberg C, Richards M, Wadsworth ME. Mortality in adults 26-54 years related to socioeconomic conditions in childhood and adulthood: Post war birth cohort study. *BMJ* 2002;325:1076-80.
 15. Finnie R; C.D. Howe Institute. The dynamics of poverty in Canada: What we know, what we can do. <<http://www.cdhowe.org/pdf/finnie-1.pdf>> (Version current at September 13, 2007).
 16. Campaign 2000. 2003 Report card on child poverty in Canada. <<http://www.campaign2000.ca/rc/index.html>> (Version current at September 13, 2007).
 17. Canadian Council on Social Development. Defining and re-defining poverty: A CCSD perspective. <<http://ccsd.ca/pubs/2001/povertyp.htm>> (Version current at September 14, 2007).
 18. Ross DP, Roberts P; Canadian Council on Social Development. Income and child well being: A new perspective on the poverty debate. Part II: Linking poverty to child outcomes. <<http://www.ccsd.ca/pubs/inckids/2.htm>> (Version current at September 14, 2007).
 19. Statistics Canada, Income Statistics Division. The assets and debts of Canadians: Focus on private pension savings. Catalogue no. 13-596-XIE. <<http://dsp-psd.pwgsc.gc.ca/Collection/Statcan/13-596-XIE/13-596-XIE2001001.pdf>> (Version current at September 14, 2007).
 20. Parker RM, Williams MV, Baker DW, Nurss JR. Literacy and contraception: Exploring the link. *Obstet Gynecol* 1996;88(Suppl 3):725-77S.
 21. Kiernan KE. Becoming a young parent: A longitudinal study of associated factors. *Br J Sociol* 1997;48:406-28.
 22. Hobcraft J, Kiernan KE; Centre for Analysis of Social Exclusion, London School of Economics. Childhood poverty, early motherhood and adult social exclusion. Case paper 28, 1999. <<http://sticerd.lse.ac.uk/Case>> (Version current at September 14, 2007).
 23. Stonehooper D; Bonnyville Healthy Babies Program. Bonnyville teen pregnancy research report. Bonnyville, Alberta, June 1997.
 24. INCLIN Multicentre Collaborative Group. Socio-economic status and risk factors for cardiovascular disease: A multicentre collaborative study in the International Clinical Epidemiology Network (INCLIN). *J Clin Epidemiol* 1994;47:1401-9.
 25. Ricciuto LE, Tarasuk VS. An examination of income-related disparities in the nutritional quality of food selections among Canadian households from 1986-2001. *Soc Sci Med* 2007;64:186-98.
 26. Heaman MI, Gupton AL, Moffatt ME. Prevalence and predictors of inadequate prenatal care: A comparison of aboriginal and non-aboriginal women in Manitoba. *J Obstet Gynaecol Can* 2005;27:237-46.
 27. Wilkins R, Sherman GJ, Best PA. Birth outcomes and infant mortality by income in urban Canada, 1986. *Health Rep* 1991;3:7-31
 28. Luo ZC, Kierans WJ, Wilkins R, Liston RM, Mohamed J, Kramer MS; British Columbia Vital Statistics Agency. Disparities in birth outcomes by neighborhood income: Temporal trends in rural and urban areas, British Columbia. *Epidemiology* 2004;15:679-86.
 29. Luo ZC, Wilkens R, Kramer MS; Fetal and Infant Health Study Group of the Canadian Perinatal Surveillance System. Effect of neighbourhood income and maternal education on birth outcomes: A population-based study. *CMAJ* 2006;174:1415-20.
 30. Spencer N, Bambang S, Logan S, Gill L. Socioeconomic status and birth weight: Comparison of an area-based measure with the Registrar General's social class. *J Epidemiol Community Health* 1999;53:495-8.
 31. Seguin L, Potvin L, St-Denis M, Loiseleur J. Chronic stressors, social support, and depression during pregnancy. *Obstet Gynecol* 1995;85:583-9.
 32. Duncan GJ, Brooks-Gunn J, Klebanov PK. Economic deprivation and early childhood development. *Child Dev* 1994;65:296-318.
 33. Siegal M, Aboud F. Characterizing the scope of socialization and its impact on health: A commentary on Singh-Manoux and Marot's "Role of socialization in explaining social inequities in health". *Soc Sci Med* 2005;61:2269-71.
 34. Richards M, Hardy R, Kuh D, Wadsworth ME. Birth weight and cognitive function in the British 1946 birth cohort: Longitudinal population based study. *BMJ* 2001;322:199-203
 35. Berle JO, Mykletun A, Daltveit AK, Rasmussen S, Dahl AA. Outcomes in adulthood for children with foetal growth retardation. A linkage study from Nord-Trøndelag Health Study (HUNT) and the Medical Birth Registry of Norway. *Acta Psychiatr Scand* 2006;113:501-9.
 36. Khan RS, Wilson K, Wise PH. Intergenerational health disparities: Socioeconomic status, women's health conditions, and child behavior problems. *Public Health Rep* 2005;120:399-408.
 37. Prescott-Clarke P, Primates P, eds. *1998 Health Survey for England: The Health of Young People 1995-97*, volume 1. London: The Stationery Office, 1998.
 38. Conger RD, Ge X, Elder GH Jr, Lorenz FO, Simons RL. Economic stress, coercive family process, and developmental problems of adolescents. *Child Dev* 1994;65:541-61.
 39. Ross DP, Roberts P. Income and child well being: A new perspective on the poverty debate. Part I: Child outcomes. Canadian Council on Social Development. <www.ccsd.ca/pubs/inckids/outcomes.htm> (Version current at September 14, 2007).
 40. Luo W, Morrison H, de Groh M, et al. The burden of adult obesity in Canada. *Chronic Dis Can* 2007;27:135-44.
 41. Kristensen J, Vestergaard M, Wisborg K, Kesmodel U, Secher NJ. Pre-pregnancy weight and the risk of stillbirth and neonatal death. *BJOG* 2005;112:403-8.
 42. Veugelers PJ, Fitzgerald AL. Prevalence of and risk factors for childhood overweight and obesity. *CMAJ* 2005;173:607-13.
 43. Shaw E, Levitt C, Wong S, Kaczorowski J; The McMaster University Postpartum Research Group. Systematic review of the literature on postpartum care: Effectiveness of postpartum support to improve maternal parenting, mental health, quality of life, and physical health. *Birth* 2006;33:210-20.
 44. Olds DL, Kitzman H. Review of research on home visiting for pregnant women and parents of young children. *The Future of Children* 1993;3:53-92.
 45. Tough SC, Johnston DW, Siever JE, et al. Does supplementary parental nursing and home visitation support improved resource use in a universal health care system? A randomized controlled trial in Canada. *Birth* 2006;33:183-94.
 46. Olds DL, Robinson J, Pettitt L, et al. Effects of home visits by paraprofessionals and by nurses: Age 4 follow-up results of a randomized trial. *Pediatrics* 2004;114:1560-8.
 47. Barlow J, Coren E. Parent-training programmes for improving maternal psychological health. *Cochrane Database Syst Rev* 2004;(1):CD002020.
 48. Wiggins M, Oakley A, Roberts I, et al. Postnatal support for mothers living in disadvantaged inner city areas: A randomized controlled trial. *J Epidemiol Community Health* 2005;59:288-295.
 49. Thomson H, Atkinson R, Petticrew M, Kearns A. Do urban regeneration programmes improve public health and reduce health inequalities? A synthesis of the evidence from UK policy and practice (1980-2004). *J Epidemiol Community Health* 2006;60:108-15.
 50. Larson CP. Efficacy of prenatal and postpartum home visits on child health and development. *Pediatrics* 1980;66:191-7.
 51. Gruen RL, Pearson SD, Brennan TA. Physician-citizens – public roles and professional obligations. *JAMA* 2004;291:94-8.
 52. Cruess RL, Cruess SR, Johnston SE. Professionalism: An ideal to be sustained. *Lancet* 2000;356:156-9.
 53. Julien G. *A Different Kind of Care: The Social Pediatrics Approach*. Montreal: McGill-Queen's University Press, 2005.
 54. Guyda H, Razack S, Steinmetz N. Social Paediatrics. *J Paediatr Child Health* 2006;11:643-645.
 55. Mackenbach JP. Tackling inequities in health: the need for building a systematic evidence base. *J Epidemiol Community Health* 2003;57:162.