Published in final edited form as:

Matern Child Health J. 2014 February ; 18(2): 389–395. doi:10.1007/s10995-013-1279-9.

Translating Life Course Theory to Clinical Practice to Address Health Disparities

Tina L. Cheng and Barry S. Solomon

Department of Pediatrics, Johns Hopkins University School of Medicine, 200 N Wolfe Street
#2055, Rubenstein Building, Baltimore, MD 21287, USA

Tina L. Cheng: tcheng2@jhmi.edu

Abstract

Life Course Theory (LCT) is a framework that explains health and disease across populations and over time and in a powerful way, conceptualizes health and health disparities to guide improvements. It suggests a need to change priorities and paradigms in our healthcare delivery system. In “Rethinking Maternal and Child Health: The Life Course Model as an Organizing Framework,” Fine and Kotelchuck identify three areas of rethinking that have relevance to clinical care: (1) recognition of context and the “whole-person, whole-family, whole-community systems approach;” (2) longitudinal approach with “greater emphasis on early (“upstream”) determinants of health”; and (3) need for integration and “developing integrated, multi-sector service systems that become lifelong “pipelines” for healthy development”. This paper discusses promising clinical practice innovations in these three areas: addressing social influences on health in clinical practice, longitudinal and vertical integration of clinical services and horizontal integration with community services and resources. In addition, barriers and facilitators to implementation are reviewed.

Keywords

Life course theory; Health disparities; Health care delivery; Maternal child; Health; Family health; Clinical care

Introduction

Life Course Theory (LCT) is a framework that explains health and disease across populations and over time [1, 2]. It is a powerful way to conceptualize health and health disparities to guide improvements in health. It suggests a need to change priorities and paradigms in our healthcare delivery system. Currently, population health strategies tend to focus on society as a whole with proactive approaches to improve health. Most current clinical strategies are disease-specific and individual-focused; reactive rather than proactive and preventive. Translation of LCT to optimal health outcomes requires the integration of population health and disease-specific strategies and the recognition of the multiple influences on health.

© Springer Science+Business Media New York 2013

Correspondence to: Tina L. Cheng, tcheng2@jhmi.edu.

Conflict of interest None. Authors do not have any affiliation, financial agreement, or other involvement with any company whose product figures prominently in the submitted manuscript.

The current United States policy environment, as well as the state of scientific and technological advances, makes it an opportune time for the translation of LCT to practice. The emphasis of the Affordable Care Act on prevention and the medical home model are in line with LCT tenets. New scientific tools and new knowledge around biologic, psychosocial and environmental influences on health are improving our ability to understand determinants of health and predict and prevent disease. This includes infectious disease tools for prevention like immunizations, genetic tools to predict future health, and knowledge on the interaction between biology and the environment influencing health at both the individual and population levels.

In “Rethinking Maternal and Child Health: The Life Course Model as an Organizing Framework,” Fine and Kotelchuck offer three areas for this rethinking: (1) recognition of context and the “whole-person, whole-family, whole-community systems approach”; (2) longitudinal approach with “greater emphasis on early (“upstream”) determinants of health”; and (3) need for “developing integrated, multi-sector service systems that become lifelong “pipelines” for healthy development” [1]. This paper presents promising clinical practice innovations in these three areas of LCT rethinking and discusses the barriers and facilitators to implementation.

Whole Person, Family and Community Approach

Individuals live within the context of their family, community and physical and social environment. To address the health needs of the whole person, family and community, it is critical to involve community members in setting priorities and developing approaches. An important initial step is to conduct a community health needs assessment and to involve community members in improvement efforts. For instance, to address the socioeconomic determinants of health, Danis et al. [3] asked low income community residents in an urban city to prioritize needed services to improve their health. The interventions prioritized by the greatest percentage of participants included health insurance, housing vouchers, dental care, job training, adult education, counseling, health behavior incentives and job placement. Understanding the perspective of community members and broadening the conceptualization of health services should guide next steps of planning services and strategies.

One model to address the multiple determinants of health is to increase the comprehensiveness of services provided in primary care practice or medical home. The medical home, developed in pediatrics and now endorsed by leading professional organizations in medicine [4], is a patient and family-centered partnership where interdisciplinary care is provided in a primary care setting. Ideally, preventive, acute and chronic care services are provided. Attributes of the medical home include continuity of care over time and comprehensive, coordinated, compassionate and culturally effective care [5]. It is care for the whole person within the context of their family and community.

The Johns Hopkins Children’s Center Harriet Lane Clinic (HLC) provides an example of a comprehensive pediatric medical home model. The HLC has served the needs of Baltimore City residents for nearly 100 years. It is the medical home to 8,500 infants, children and adolescents of which about 40 % have at least one chronic condition. When families were queried about their social needs, employment, education, child care, food, and housing were the most frequently cited [6]. Parents and clinic staff recognized that child health is inextricably linked to the basic needs of the child and the health of their family. When the clinic parent advisory board was asked about services they felt would benefit their children’s health, they identified dental care, educational supports, parenting support, mental health and safe environments and activities for their children and adolescents. Again, addressing

the whole child including their physical, mental and social well being and optimal development must be priorities.

With community organization partnership, hospital and foundation funding support, the clinic has developed innovative and value-added “wrap around” services not typically found in other pediatric primary care clinics (see Fig. 1). It is a comprehensive, integrated primary care model for predominantly poor, urban families providing medical care and an array of on-site health-related services including: medical and dental care, mental health evaluations and treatment, case management programs for children with special health care needs, developmental evaluations, nutrition and lactation services including an on-site Women, Infants and Children (WIC) Supplemental Food and Nutrition Program, universal screening for family social needs and risks, screening and surveillance for child developmental and educational issues, screening and services for mothers experiencing depression and intimate partner violence, legal aid with a full time lawyer, Safety Lane Injury Prevention Center with a full time health educator and hands-on experiential modules, fitness and nutrition program to address child and adolescent obesity, Reach Out and Read child literacy and adolescent literacy programs, Healthy Futures Tutoring and Career Counseling Programs, Health Leads© Family Help Desk staffed by undergraduate volunteers, social work services, child life services, adolescent specialty care and reproductive health services, adolescent transition services, and intensive primary care program for children and adolescents with HIV.

Evaluation of components of this comprehensive approach demonstrates promising outcomes. For instance, a randomized trial of the career counseling program has found that adolescents who were part of the motivational interviewing intervention were more likely to have greater future orientation and reduced fighting behavior and marijuana use than those who were not part of the program [7]. Families who received injury prevention counseling from their child’s clinicians and visited the clinic’s on-site Safety Lane safety resource center implemented more home safety practices than a comparison group [8]. Parents referred by their child’s providers to the on-site Health Leads© Family Help Desk were successfully connected to community-based services and programs [9, 10]. The HLC has also demonstrated success with maternal depression and intimate partner violence screening and linkage to care during routine well baby visits [11]. The web of services provided is guided by the needs of the patients and families served. Services address the whole patient and family and the psychosocial challenges often at the root of their health issues (i.e., the “social determinants of health”).

The obstacles to disseminating this approach include cultural and structural barriers. Integrating physical, mental health and dental services must transcend traditional disciplinary and bureaucratic boundaries and separate reimbursement processes. Changing attitudes to recognize the model’s convenience for families and advantages for general health require a collaborative interdisciplinary team-based approach. Developing mechanisms to bill for services outside of the medical realm (e.g. legal advocacy to get rid of cockroaches in the home of a child with asthma) is a continuing challenge. However, the advantages of this comprehensive medical home approach are the ability to identify and address many issues and service needs at one location and in a coordinated fashion.

Upstream Intergenerational Approach in Clinical Practice: Longitudinal and Vertical Integration

Growing research has recognized that there are early antecedents to adult disease and that it is critical to ensure prenatal and child health to avoid or delay the onset of adult disease [12]. Life course research demonstrates the power of early childhood health and experiences

influencing adult conditions such as diabetes, cardiovascular disease, depression [12, 13]. For instance, the Adverse Childhood Experiences study by the Centers for Disease Control and Prevention and Kaiser Permanente has demonstrated that experiences of early adversity (childhood abuse, neglect, and exposure to other traumatic stressors) influenced many adult health outcomes (e.g. chronic obstructive pulmonary disease, heart disease, depression, alcoholism) in a strong and graded fashion [14, 15]. Upstream prevention of these early adversities has high potential for payoff in health outcomes and dollars [16]. The Harriet Lane Clinic comprehensive model addresses upstream factors by focusing early (on infants and children), engaging families and addressing social and biologic adversities. For instance, reversing adult obesity often already accompanied by co-morbidities, is a difficult challenge. However, starting early and preventing childhood overweight and obesity through healthy diet and physical activity has the potential to change the child's health trajectory and reduce risk for adult obesity, diabetes and other associated morbidities. It also encourages lifelong healthy habits for the child with additional benefit for family members.

To eliminate health disparities, attention is needed for research and preventive strategies within a life-course perspective. Halfon et al. [17] have discussed the need for service linkage pathways to integrate personal and population approaches that optimize an individual's developmental trajectory through childhood, adolescence and adulthood. They discuss the need for vertical and horizontal integration of services. *Vertical integration* of health services spans primary, secondary and tertiary care and different health disciplines. *Horizontal integration* involves the merging of health services with other service sectors including the health, social and civic sectors. *Longitudinal integration* of services across the age span suggests that attention to transition points is needed where handoffs or discontinuities in service providers (e.g. transition from prenatal to postnatal care or transition of pediatric to adult health care) can be challenging. *Intergenerational integration* of services when a woman becomes pregnant and a new child enters the family is also needed with recognition of the interdependence of the health of family members across generations.

Table 1 describes the current medical care system need to incorporate LCT concepts encouraging a new paradigm for clinical care emphasizing longitudinal/intergenerational, vertical and horizontal integration with a focus on the individual, family and population. The first column describes the current characteristics and organization of the U.S. medical system described further below. The second column describes Life Course Theory concepts from the "rethinking maternal child health" white paper [1]. The third column operationalizes the clinical practice changes needed to incorporate Life Course Theory.

In the U.S., clinicians and their services tend to be segmented by age (e.g. obstetrics, pediatrics, internal medicine, geriatrics), setting (e.g. primary care, emergency medicine, hospital medicine, intensive care, specialty care, long-term care) and specialized by organ system (e.g. cardiology, gastroenterology, nephrology, etc.). Segmentation of clinicians by age group allows specialization of unique developmental needs, but inhibits a life course perspective on health, development and disease. Longitudinal and vertical integration are needed across clinicians and systems specialized by age, settings, or organ systems. As new medical discoveries are made, integration is also needed to ensure efficient translation of research to practice and to populations.

Internal medicine-pediatrics and family medicine clinicians have the capacity to see patients across their life course. Family medicine clinicians also have the capacity to provide intergenerational family centered care as they can offer continuity of care when a woman becomes pregnant and provide care for both the mother and newborn. Outside of family medicine, collaboration of clinicians across patient age groups and in shared settings offers

the potential for more family centered care, recognition of life course influences, smoother life course transitions and implementation of tenets of Life Course Theory.

But how can better longitudinal vertical integration occur? An example of longitudinal, intergenerational and vertical integration is a new Preconception Women's Health in Pediatrics Initiative at the Johns Hopkins University pediatric clinics including the Harriet Lane Clinic. The purpose of this initiative is to reduce inequities in birth, infant and maternal health outcomes by promoting women's health in pediatric practices and removing barriers to preconception and interconception care for low income women. The initiative emphasizes the importance of preconception health to address infant mortality [18] and involves collaboration among obstetrician/gynecology, pediatrics and internal medicine clinicians to smooth transitions through the life course and across generations [19]. It involves the provision of the postpartum visit, family planning and, for some women, their full primary care in pediatric practice in conjunction with well baby visits [20]. The initiative eases a challenging life course transition point, the birth of a child, by addressing both the child and mother's health in a family centered way. It addresses the discontinuities of services across professions, breaking down narrowly defined professional silos, and focusing holistically on factors influencing health of the mother, child, family unit and future children. Barriers to care are reduced by providing care to the mother and child in one location and assisting low income mothers in maintaining medical insurance which transitions at 8 weeks postpartum when medical assistance ends for many. Finally, it encourages planning for a mother's next pregnancy which affects the health and well-being of the mother, child and family. Teen-tot programs have a long history of this type of model with positive outcomes for child and mother [21, 22]. The model provides longitudinal and intergenerational integration of services over time and vertical integration of services across medical disciplines and settings.

Programs that ease transitions in care across the life course and across generations have great potential to improve the health of individuals, the health families and the health of their future children. Within the family unit the health of adults influence the health of children and vice versa. For example, maternal depression, substance use and poor physical health clearly have detrimental effects on child health [23]. Conversely, childhood pneumococcal immunization has been found to reduce carriage and infection among adults [24]. It is important to recognize the impact of interventions on individuals over time and spillover effects on families. Longitudinal and vertical integration of health services across the life course and easing transitions of care should be clinical priorities.

Service Sector Integration: Horizontal Integration

While vertical integration focuses on the traditional health system, horizontal integration involves the merging of health services with other service sectors including health, social and civic sectors. The "health in all policies" strategy recognizes that health is affected by programs and policies that do not explicitly address health or may not traditionally be part of the health sector [25]. This includes policies regarding housing, agriculture, transportation, the environment, and general budget priorities. Health impact assessment (HIA) has been promoted as a way to consider the effects that policies may have on health of a population. HIA has been defined as "a combination of procedures, methods and tools that systematically judges the potential, and sometimes unintended, effects of a policy, plan, program or project on the health of a population and the distribution of those effects within the population. HIA identifies appropriate actions to manage those effects." [26] Examples of HIAs include assessment of new transportation policies' impact of expected traffic congestion, pollution and unintended health effects in highly populated areas or assessment of proposed zoning codes to increase health promoting potential and mitigate unanticipated

negative health consequences [27, 35]. In performing health impact assessments and in the ultimate implementation of the policies or programs, sectors must work together to enhancing health across the life course. In the United States there has been a call for coordinated federal approaches for child health and well-being using a multisector approach that acknowledges that children are affected by sectors across health, education and social services [28].

The Institute of Medicine report on Primary Care and Public Health: Exploring Integration to Improve Population Health acknowledges that integration occurs on a continuum from sectors working in isolation and in silos to different degrees of integration from mutual awareness, cooperation, collaboration, partnership to merging systems [29]. While many clinicians already work with professionals in other service sectors, there is great opportunity to move from mutual awareness to true partnership in the integration of systems. True partnership involves communication, recognition of mutual benefit and merging of systems. In the Harriet Lane Clinic's incorporation of multi-sector services it was important not simply to have co-located services, but to have integration with communication and coordination of services focusing on the health and social needs of the child and family.

Finally, integration needs to occur at the places and settings where individuals spend their time. For instance, daycare or school-based health services offer the opportunity to reach children where they spend significant time. Home visitation programs for high risk children and worksite clinics for adults are poised to grow with Affordable Care Act promotion [30]. Programs at these sites could promote wellness and prevention on an individual and population level and could become the site for the medical home or integrate with the medical home. Place-based strategies focusing on specific geographic areas and population approaches also have the potential to reduce barriers to care and promote health.

A national example of merging systems to address the needs of disadvantaged children is England's Sure Start Program. Begun in 1998, this program integrates early childhood education, childcare, family supports and child and family health services for the shared goal of "giving children the best possible start in life" [31]. Sure Start Local Programmes were set up as community-based, multi-agency, projects in disadvantaged areas in England with an emphasis on outreach and community development. Centers provide early learning and play programs and family support integrated with health services and home visitation. The program has undergone change over the years with transition to a network of Sure Start Children's Centres. Evaluation has shown positive, if modest, effects for all child and family outcomes [32] and documented lessons learned about effective multi-agency teamwork [33, 34]. The program serves as a model of horizontal integration with recognition of the need to align goals and incentives of the different sectors and build political will to develop "multi-sector service systems that become lifelong 'pipelines' for healthy development." [35].

The Commonwealth Fund report on "Ensuring Equity: A post-Reform Framework to Achieve High Performance Health Care for Vulnerable Populations" [3, 6] discusses the need for vertical clinical integration of services across settings in an integrated health care delivery system. Payment reform and regulatory change explicitly encouraging collaboration and affiliation are needed. They also urge horizontal integration to foster an infrastructure of community-based support services and aligning efforts between the health care delivery system and public health services. For clinical practice this may mean working in different settings with an expanded set of team members and range of services.

A longitudinal, vertically, horizontally, and intergenerationally integrated approach requires a culture change in medicine and its traditional disciplines segmented by age, setting and specialty. It also requires a change in financing structures that currently do not incentivize an

integrated approach. Growing research on early antecedents of disease and cost-effectiveness of prevention, care coordination across settings, specialties and sectors, and population health strategies all support a Life Course Theory integrated approach to clinical care. The Harriet Lane Clinic is but one model. Patient and family appreciation of available services has broadened staff and institutional perspectives on health and what can be accomplished in the clinic setting. Demonstrated effectiveness in case stories and evaluation data have influenced insurers and private funders to support the clinic's approach to reduce disparities. To translate and disseminate Life Course Theory across clinical practices will require political will, payment reform and continued development and evaluation of innovative integrated health care delivery models.

Conclusion

Growing scientific knowledge about the biologic and social influences on health support the importance and relevance of Life Course Theory. LCT can guide innovations in clinical practice to improve health across the life course and across generations. To translate theory to practice, clinicians have the opportunity to (1) address “whole-person, whole-family, whole-community systems approach” by expanding practices to include services addressing social determinants of health; (2) address early “upstream” determinants of health to change personalized trajectories and (3) participate in efforts for longitudinal, vertical, horizontal and intergenerational integration of services and systems within the medical system and with other service sectors. LCT challenges current paradigms and priorities in clinical care but offers great potential to optimize health and reduce disparities.

Acknowledgments

This publication was supported by the National Institute of Child Health and Human Development Grant Number K24HD052559 (Cheng) and the DC-Baltimore Research Center on Child Health Disparities P20MD000198 from the National Institute on Minority Health and Health Disparities. Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the funding agencies.

References

1. Fine, A.; Kotelchuck, M. Rethinking MCH: The MCH life course model as an organizing framework. US DHHS, HRSA, Maternal and Child Health Bureau; 2010. Accessed at <http://mchb.hrsa.gov/lifecourse/rethinkingmchlifecourse.pdf> [7-29-11]
2. Halfon N, Hochstein M. Life course health development: An integrated framework for developing health, policy and research. *Milbank Quarterly*. 2002; 80(3):433–479. [PubMed: 12233246]
3. Danis M, Kotwani N, Garrett J, Rivera I, Davies-Cole J, Carter-Nolan P. Priorities of low-income urban residents for interventions to address the socio-economic determinants of health. *Journal of Health Care for the Poor and Underserved*. 2010; 21:1318–1339. [PubMed: 21099082]
4. American Academy of Family Physicians (AAFP), American Academy of Pediatrics (AAP), American College of Physicians (ACP), & American Osteopathic Association (AOA). [Accessed 6-7-12] Joint principles of the patient-centered medical home. 2007 Mar. 2007 http://practice.aap.org/public/pmo_document302_en.pdf
5. Starfield, B. Primary care: Concept, evaluation and policy. New York: Oxford University Press; 1992.
6. Garg A, Butz AM, Dworkin PH, Lewis RA, Serwint JR. Screening for basic social needs at a medical home for low-income children. *Clinical pediatrics (Phila)*. 2009; 48(1):32–36.
7. Lindstrom Johnson, S.; Jones, V.; Cheng, TL. Creating “healthy futures”: Results from a motivational interviewing intervention to promote future orientation and improve health outcomes. *Pediatric Academic Societies Abstracts*. #3455.8. 2012. <http://www.abstracts2view.com/pas/>

8. Gielen AC, McDonald EM, Wilson MEH, Hwang WT, Serwint JR, Andrews JS, et al. Effects of improved access to safety counseling, products, and home visits on parents' safety practices. *Archives of Pediatrics and Adolescent Medicine*. 2002; 156:33–40. [PubMed: 11772188]
9. Garg A, Marino M, Vikani AR, Solomon BS. Addressing families' unmet social needs within pediatric primary care: the health leads model. *Clinical Pediatrics*. 2012 Mar. 2012 Epub ahead of print.
10. Garg A, Sarkar S, Marino M, Onie R, Solomon BS. Linking urban families to community resources in the context of pediatric primary care. *Patient Education and Counseling*. 2010; 79:251–254. [PubMed: 19962849]
11. Kornfeld BD, Bair-Merritt MH, Frosch E, Solomon BS. Postpartum depression and intimate partner violence in urban mothers: co-occurrence and child healthcare utilization. *J Pediatr*. 2012 Epub ahead of print.
12. Braveman P, Barclay C. Health disparities beginning in childhood: A life-course perspective. *Pediatrics*. 2009; 124:S163–S175. [PubMed: 19861467]
13. Kuh, D.; Ben-Shlomo, Y., editors. *A life course approach to chronic disease epidemiology*. New York, NY: Oxford University Press; 1997.
14. Felitti VJ, Anda RF, Nordenberg D, Williamson DF, Spitz AM, Edwards V, et al. Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: The adverse childhood experiences (ACE) study. *American Journal of Preventive Medicine*. 1998; 14:245–258. [PubMed: 9635069]
15. Centers for Disease Control and Prevention. [Accessed 9-29-12] Adverse childhood experiences (ACE) study. <http://www.cdc.gov/ace/index.htm>
16. Heckman JJ. Skill formation and the economics of investing in disadvantaged children. *Science*. 2006; 312(5782):1900–1902. [PubMed: 16809525]
17. Halfon N, DuPlessis H, Barrett E. Looking back at pediatrics to move forward in obstetrics. *Current Opinion in Obstetrics and Gynecology*. 2008; 20:566–573. [PubMed: 18989133]
18. Centers for Disease Control and Prevention, Recommendations to improve preconception health and health care—United States. A report of the CDC/ATSDR preconception care work group and the select panel on preconception care. *MMWR*. 2006; 55(RR06):1–23.
19. Cheng TL, Guyer B, Kotelchuck M. Preconception women's health and pediatrics: An opportunity to address infant mortality and family health. *Academic Pediatrics*. 2012; 12(5):357–359. [PubMed: 22658953]
20. Akinbami L, Cheng TL, Balbus Kornfeld D. Review of the effectiveness of teen-tot programs: Comprehensive care for young parents and their children. *Adolescence*. 2001; 36:381–393. [PubMed: 11572313]
21. Beers LS, Hollo RE. Approaching the adolescent-headed family: A review of teen parenting. *Current Problems in Pediatric and Adolescent Health Care*. 2009; 39(9):216–233. [PubMed: 19857857]
22. National Research Council; Institute of Medicine. Committee on depression, parenting practices, and the healthy development of children. In: England, MJ.; Sim, LJ., editors. *Depression in parents, parenting, and children: Opportunities to improve identification, treatment, and prevention*. Washington, DC: The National Academies Press; 2009.
23. Whitney CG, Farley MM, Hadler J, et al. Decline in invasive pneumococcal disease after the introduction of protein-polysaccharide conjugate vaccine. *New England Journal of Medicine*. 2003; 348:1737–1746. [PubMed: 12724479]
24. Collins J, Koplan JP. Health impact assessment: A step toward health in all policies. *JAMA*. 2009; 302(3):315–317. [PubMed: 19602691]
25. Quigley, R.; den Broeder, L.; Furu, P.; Bond, A.; Cave, B.; Bos, R. Health impact assessment international best practice principles. Fargo, ND: International association for impact assessment; 2006. 1. Special Publication Series 5
26. Thornton, RLJ.; Fichtenberg, CM.; Greiner, A.; Feingold, B.; Ellen, JM.; Jennings, JM., et al. *Zoning for a healthy Baltimore: A health impact assessment of the transform Baltimore comprehensive zoning code rewrite*. Baltimore, MD: Johns Hopkins University Center for Child and Community Health Research; 2010.

27. National Opinion Research Center (NORC). [Accessed 5-29-12] Improving children's health and well-being by integrating children's programs. 2011 Feb 1. <http://www.firstfocus.net/library/reports/improving-children's-health-and-well-being-by-integrating-children's-programs>
28. Institute of Medicine. Primary care and public health: Exploring integration to improve population health. Washington, DC: The National Academies Press; 2012.
29. Sarasohn-Kahn, J. California HealthCare Foundation. [Accessed 9-28-12] Primary care, everywhere: Connecting the dots across the emerging health landscape. 2011. <http://www.chcf.org/publications/2011/11/primary-care-everywhere>
30. United Kingdom Department for Education. [Accessed 6-4-12] <http://www.education.gov.uk/childrenandyoungpeople/earlylearningandchildcare/delivery/surestart/a0076712/sure-start-children's-centres>
31. National Evaluation of Sure Start research Team. [Accessed 6-4-12] The impact of sure start local programmes on 3 year olds and their families. <http://www.ness.bbk.ac.uk/impact/documents/42.pdf>
32. Anning, A. The National Evaluation of Sure Start Team. [Accessed 6-4-12] Understanding variations in effectiveness amongst sure start local programmes: Lessons for sure start children's centres. <https://www.education.gov.uk/publications/eOrderingDownload/NESS2007SF024.pdf>
33. Lexau CA, Lynfield R, Danila R, et al. Changing epidemiology of invasive pneumococcal disease among older adults in the era of pediatric pneumococcal conjugate vaccine. JAMA. 2005; 294:2043–2051. [PubMed: 16249418]
34. Fine, A.; Kotelchuck, M. Rethinking MCH: The MCH life course model as an organizing framework. U.S. DHHS, HRSA, Maternal and Child Health Bureau; 2010. <http://mchb.hrsa.gov/lifecourse/rethinkingmchlifecourse.pdf> [Accessed 7-29-11]
35. Schor, EL.; Berenson, J.; Shih, A.; Collins, SR.; Schoen, D.; Riley, P.; Dermody, C. Ensuring equity: A post-reform framework to achieve high performance health care for vulnerable populations. The Commonwealth Fund; 2011 Oct. 2011, <http://www.commonwealthfund.org/Publications/Fund-Reports/2011/Oct/Ensuring-Equity.aspx> [Accessed 6-4-12]

Fig. 1.
Harriet lane clinic: a comprehensive community clinic

Table 1

Future life course theory paradigm for health care delivery

Current medical system	Life course theory concept	Life course theory paradigm for clinical care
<i>Organized by age:</i> Ob-gyn, pediatrics, Internal medicine, geriatrics (exceptions: family medicine, internal medicine-pediatrics)	“Emphasis on early (“upstream”) determinants of health” “Lifelong development/lifelong intervention” “Whole-family” approach	<i>Longitudinal and intergenerational Integration</i>
<i>Organized by setting:</i> Primary care, emergency medicine, hospital medicine, intensive care, specialty care, long-term care	“Development of referral/linkage services to assure timely linkage to a range of needed services within...the health system...”	<i>Vertical Integration</i> across health settings
<i>Organized by specialty organ system:</i> Cardiology, gastroenterology, nephrology, neurology, etc.	“Whole-person” approach	<i>Vertical Integration</i> across health disciplines
<i>Medical sector focus</i>	“Whole-community systems approach” “Developing integrated, multi-sector service systems that become lifelong “pipelines” for healthy development.”	<i>Horizontal integration</i> across sectors influencing health
<i>Individual focus</i>	“Population focused and firmly rooted in social determinants and social equity models”	<i>Individual, family and population focus</i>