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Patton, GC; Viner, RM; le, CL; Ameratunga, S; Fatusi, AO; Ferguson, BJ; Patel, V (2010) Mapping a Global Agenda for Adolescent Health. *The Journal of adolescent health*, 47 (5). pp. 427-432. ISSN 1054-139X DOI: <https://doi.org/10.1016/j.jadohealth.2010.08.019>

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Published in final edited form as:

J Adolesc Health. 2010 November ; 47(5): 427–432. doi:10.1016/j.jadohealth.2010.08.019.

Mapping a Global Agenda for Adolescent Health

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Abstract

Major changes in health are underway in many low- and middle-income countries that are likely to bring greater focus on adolescents. This commentary, based on a 2009 London meeting, considers the need for strategic information for future global initiatives in adolescent health. Current coverage of adolescent health in global data collections is patchy. There is both the need and scope to extend existing collections into the adolescent years as well as achieve greater harmonization of measures between surveys. The development of a core set of global adolescent health indicators would aid this process. Other important tasks include adapting and testing interventions in low- and middle-income countries, growing research capacity in those settings, better communication of research from those countries, and building structures to implement future global initiatives. A global agenda needs more than good data, but sound information about adolescent health and its social and environmental determinants, will be important in both advocacy and practice.

Over the past century, economic development has brought striking changes in health in the high-income world [1,2]. This “health transition” is now bringing similar shifts in many low- and middle-income countries (LMIC) [1]. Housing, sanitation, maternal education, infant care, vaccination, vector control, and better systems of health care have brought particular benefits to women and the very young, evident in the falling mortality of mothers and infants [3,4]. The effects on adolescent health have received little attention [5]. As with other age groups, economic development has reduced risks from acute medical illnesses. However, it has complex effects on the social contexts in which young people grow and on the lifestyles that they adopt. These may not always be beneficial for health [6]. Continuing success in

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reducing disease in earlier childhood also shifts attention to problems that are prominent during adolescence, including injury, mental health, and chronic physical illness [7].

Adolescents have also come into focus in the promotion of economic development. Many countries have entered or are about to enter a demographic transition in which lower fertility and dependency rates are likely to increase the proportion of people who are able to work. Such an opportunity to reduce poverty levels may not come again [5]. Approximately 90% of the world's young people living in LMIC offer a demographic dividend that has the potential to shape the economic prospects of their own countries as well as the global economy. But this potential is, in turn, dependent on the education and health of these young people as they enter the workforce [8]. Together with evidence that the health and education of adolescent girls is a major determinant of child health in the next generation, the economic and social reasons for attending to adolescent education and health are stronger than ever [9].

These issues have been the central themes in recent global work on adolescent health [5,10,11] and were the background for “Beyond Mortality,” a meeting of over 40 leading academicians from across the globe at London's Institute of Child Health in September 2009 [12]. The meeting coincided with the publication of the first comprehensive study on the global mortality rates in young people [13]. It considered the scope for developing a more complete global picture of adolescent health, addressing the range and severity of problems as well as the potential for prevention and clinical interventions. This commentary summarizes the discussions from that meeting. In this article, we use the terms adolescents, youth, and young people interchangeably to refer to the 10–24-year-old age group.

Current global health perspectives

The Millennium Development Goals (MDGs) represent commitments made by 189 governments in the year 2000 to coordinate responses across health and other areas relevant to the elimination of poverty. The MDGs also provide an entry point for the consideration of adolescent health by designating targets particularly relevant to the youth. These include literacy of 15–24-year-olds (MDG 2); the ratio of females to males in primary, secondary, and tertiary education (MDG 3); unemployment rates among 15–24-year-olds (MDG 8); birth rates among adolescents (MDG 5); and the prevalence and knowledge of Human Immunodeficiency virus (HIV) among 15–24-year-olds (MDG 6). In addition, given the relationship between the young age at pregnancy and neonatal death, adolescent pregnancy is relevant to MDG 4 for child mortality.

Patton et al's recent youth mortality study described other health priorities among youth, as well as illustrating the potential of data to shape a global strategy [13]. Profound differences exist between patterns of death among young people in high- and low-income countries. Around two-thirds of all deaths in this age group are in sub-Saharan Africa and South-east Asia. Maternal mortality, tuberculosis, and HIV remain major causes of death in young people in very low-income countries. Yet, the effects of the health transition are already evident. Most middle-income countries have already moved to much lower death rates among youth with injuries—including road traffic deaths, suicide and homicide—the

leading causes of death. Globally, injuries account for approximately 40% of deaths among youth, a striking contrast to the older age groups, where they account for only 12% [13]. Forward projections to 2030 indicate that road traffic injuries, suicide, and violent death will increase, and that this younger age group is the most likely to be affected [14].

The differences in adolescent mortality between different regions are not accounted for by economic factors alone. Among the middle-income countries, China had low youth mortality rates, in sharp contrast to many Eastern European and Central and South American countries [13]. Other structural factors related to the cultural, political, and socio-economic aspects of adolescent development seem to be important in understanding these variations in deaths across the world. In India and Pakistan, the adoption of traditional gender roles has been linked with use of alcohol and violence, as well as accidental injury and suicide [15,16]. Female roles have been characterized by a lack of autonomy and risk for becoming victims of violence and abuse [17]. In sub-Saharan Africa, the region with the highest rates of adolescent deaths, maternal mortality, and HIV were the leading causes of death, reflecting in part, early marriage, lack of empowerment of young women, and weak health systems [18,19].

Beyond mortality: growing a clearer global picture of adolescent health

Besides the data available on global mortality among adolescents and young people, what other data is required to build a global picture [13]? Mortality is best considered as the tip of an iceberg [20]. For example, mortality alone is unlikely to capture patterns of sublethal injuries, their potential for life-long disabilities, and risk factors for targeting injury prevention [14]. These limitations extend to other leading health problems in young people. Annual mortality rates do not reflect the totality of the HIV burden, tuberculosis, or nutritional disorders. More importantly, mortality does little to capture the large burden of disorders associated with nonlethal mental health problems common in adolescents and young adults [21]. These problems are arguably the major contributors to the disease burden among youth in many parts of the world, but these rarely lead to death [22]. Finally, risk factors, such as use of tobacco, have their onset during adolescence, make a massive contribution to mortality and disability in later life, but are not reflected in mortality rates among adolescents [21].

The mortality data also illustrate some of the challenges in developing good information systems to underpin the globally oriented work carried out on adolescent health [23]. The poorest quality data come from those regions where mortality and morbidity early in life are highest, such as sub-Saharan Africa, the Middle East, and southern Asia. Adolescents are also disadvantaged in that they are not included in the major global data collection systems that focus either on the health of younger children or adults [24]. Furthermore, most global data collections have been oriented toward the study of specific diseases, such as HIV, malaria, and tuberculosis; with the exception of early childhood, these data are rarely disaggregated by age. As such, these “vertical” data collection programs do not necessarily capture youth manifestations of problems, the ways in which young people might respond to clinical care, or which preventive interventions may be particularly relevant for adolescents [25,26]. With the exception of research on sexual and reproductive health, current health

information systems have done little to emphasize the environments in which young people grow, live, and work. In high-income countries, the quality of family, neighborhood, school, and workplace environments predict a range of health problems initiated during the adolescent years. Growing evidence suggests that interventions in these settings can make a difference to their health and development [27,28]. Such influences are likely to be important for young people in LMIC, but until now, there has been little effort to adapt and test these interventions in new settings.

There are signs that this may be changing. One of the earliest data collection initiatives in LMIC was the Demographic and Health Surveys (DHS). These household surveys date back to the 1980s and focus on fertility, mortality, and family planning across 77 countries. DHS provide data on sexual activity, knowledge of HIV, fertility, family planning, media exposure, nutrition, and attitudes toward intimate partner violence. Increasingly, they are complemented by other sources. UNICEF's Multiple Indicator Cluster Surveys provide some health information relevant to the MDGs for those up to the age of 25 years. These household surveys are drawn largely on information from young women and provide limited data on other major health problems of youth, such as injury and mental health. School-based surveys have also shown impressive growth. The Health Behaviour in School Aged Children (HBSC, World Health Organization Collaborative Cross-National Study) provides a picture of adolescent health in a growing number of high- and middle-income countries [29,30]. Surveys take place every 4 years, the most recent in 2009-2010 involved 43 countries across Europe and North America. The Global school-based health survey (GSHS) has a similar focus on health risk behaviors of younger adolescents in over 80 LMIC and is methodologically aligned with the even more widely implemented Global Youth Tobacco Survey (GYTS) [31].

Other important data collections have given less attention to adolescents but are likely to have growing relevance. The IN-DEPTH research network has been established across 37 demographic surveillance sites in 19 countries and provides some of the only available data on youth mortality in these low-income countries [32]. The STEPwise approach to surveillance survey of risks for chronic physical illness has taken place in nearly 100 countries [33,34]. Although its principal focus is on adults, approximately half of these countries have included 15-24-year-olds in the survey. Additionally, countries such as India, Vietnam, Thailand, and the Philippines have recently seen impressive national developments in gathering strategic information on adolescent health [35,36].

Next steps

Although there are considerable challenges in making international comparisons even in countries with similar levels of income, these data collections have added to the available global picture, and the benefits are evident in a series of recent publications on adolescent health and development [5,9,10,37,38]. Such reports have provided opportunities to frame the arguments for investment in adolescent health. Further information is required for any sustained investment in this field. The London meeting considered the following priorities around the development and application of global data on adolescent health.

Getting better global data

Having a comprehensive picture of health need is essential in arguing the case for a global agenda [39]. Adolescents have not yet attracted the attention that is given to other age groups in data collections. Including adolescents and their health problems in these collection systems is an important step. Greater harmonization of health assessment tools would be a further important step, particularly in school-based surveys. Admittedly, limits to global comparability might arise from the different health profiles and priorities for young people in the low-income countries of Africa and Asia. Yet despite great cross-national and cultural differences, the evidence suggests that globalization is bringing a convergence in the health problems of adolescents in many LMIC with those of the high-income world [40]. The development and use of common indicators, motivated in part by the need to measure progress towards the MDGs, has played an important role in guiding recent global data collections [41]. Establishing core indicators for adolescent and young adult health might similarly be useful in encouraging coherence in data collection globally. Such indicators might eventually form the basis of a global adolescent health index, linked both to data collection systems and the evaluation of policy initiatives.

Adapting and testing interventions in low- and middle-income settings

Beyond building a global adolescent health profile, any aggregation of data also raises important questions about the generalization of health and the evidence of its prevention from high-income countries to middle- and lower-income settings. Differences in the level of resources—including adolescent-focused health, as well as macroeconomic, cultural, and political resources—are likely to mean that interventions need to be developed and tested within those contexts. Such local testing would do much to ensure their success and eventual sustainability, as well as the value of an adolescent health perspective.

Growing research capacity

A longer-term challenge is the capacity of the adolescent health field to conduct and interpret research that has been performed outside high-income countries and international agencies. Gaining, retaining, and maintaining research capacity in low-resource settings is difficult in many areas of health [42]. North–South partnerships have been widely adopted; given the commitment, good communication, mutual respect, clear roles, and political support, these can be effective in extending the research capacity in low-resource settings [43,44]. South–South partnerships have come increasingly into focus. The Consortium for Advanced Research Training in Africa initiative is an example of a partnership to train public health researchers across 12 low-income countries with support from universities in developed countries [45]. Whether capacity-building research in LMIC would best be developed as a stand-alone venture in adolescent health or through the augmentation of existing public health structures is a question that must be addressed in due course. In the immediate future, it seems unlikely that the field will have the capacity to train researchers besides those in existing public health and clinical training schemes. The nesting of short courses in adolescent health research within these existing schemes is likely to be the most fruitful strategy in the short- to medium-term.

Communicating research findings

Medical journals also have important roles in communicating health needs and advocacy [46–49]. But specialist journals face barriers in representing research from LMIC [50,51]. Comparatively fewer articles are submitted by these countries, and they have a higher likelihood of rejection. The limited research expertise in these countries is undoubtedly one factor, the other being lack of English proficiency. Journal policies that encourage partnerships with researchers in LMIC and give attention to health problems prominent in those countries have the potential to shift the balance [52,53]. Language-based and local journals will remain important as the main destination for work on adolescent health in many countries. These journals are numerous, but their limited inclusion in international databases means that the research published in these journals is often difficult to access. Working with these local and regional journals to strengthen their quality and ensure indexation would improve our global picture of adolescent health to a great extent.

Building global processes

Currently, no clear auspice or inclusive forum exists for global academic work in adolescent health. The Society for Adolescent Health and Medicine and the International Association of Adolescent Health have played important roles in developing international perspectives. A range of other academic groups—such as the Society for Research on Adolescence, the Population Association of America, and specialist groups in areas such as injury and mental health—undertake important global adolescent health research. Many agencies of the United Nations have also made important contributions and will continue to have significant roles. Without strong institutions to promote and sustain advocacy, any attempt to develop a global agenda in adolescent health is likely to fail [39].

In other fields of global health, the coordination of strategic information has underpinned many advances [23]. For example, the Child Health Epidemiology Reference Group was established in 2001 in response to the need for better information on infant and child mortality in pursuit of MDG 4 [54]. The Child Health Epidemiology Reference Group subsequently extended its work to examine the relationships between infant and maternal mortality, and over the course of almost a decade, produced publications that have shaped global policy debates and responses to early childhood mortality and disease. In areas of global health significance such as malaria control, vaccine-preventable diseases, and diarrheal diseases, monitoring and evaluation groups have been appointed [23]. Adolescent health might also gain much from an entity charged with drawing together the different strands of health information. Such an entity's work plan might include the development and maintenance of a global index of adolescent health, the promotion of harmonization of data across the different sources of study, the provision of technical support for the reorientation of current global data collections, and the gathering of information on neglected issues, such as substance use and mental health.

A different response might be the establishment of a more broad-based partnership amongst the diverse global agencies concerned with adolescent health. The influential Partnership for Maternal, Newborn and Child Health was launched in 2005 to link the maternal, newborn, and child health communities [55]. It has roles in management of knowledge, synthesis of

evidence, advocacy, and information sharing. It has grown into an alliance of over 300 members. In part, this alliance came about from efforts to meet MDG 4 (infant mortality) and MDG 5 (maternal mortality). Although the MDGs have heightened interest in adolescent girls and HIV among young people, similar youth initiatives are not yet on an equivalent scale [56]. Looking beyond the 2015 target date for the MDGs, there may be opportunities to advocate for more comprehensive approaches to adolescent health within future global initiatives.

Any global adolescent health agenda will need more than good data, though sound information about health in the social, cultural, and economic contexts in which young people grow will be increasingly important in advocacy [10,39]. Extending our existing global health information systems to young people as well as giving greater attention to harmonization of data between adolescent surveys should be feasible. Together with demonstrations of the efficacy of interventions in low-resource settings, this information will be central to the case for adolescent health. Even so, building support for adolescent health in resource-constrained LMIC environments, many with competing health and nonhealth agendas, will remain difficult. Initiatives in adolescent health should be seen as preserving the gains now being realized in younger children. More than that, they will ensure the health and productivity of tomorrow's adults, who will in turn be better parents for the next generation [5]. Building the map to guide that global agenda would be a major step forward.

Acknowledgments

This paper has drawn on discussion held at meeting in September 2009, at the Institute of Child Health, University of London. The meeting was supported by the Institute of Child Health and the Murdoch Children's Research Institute. A summary of that meeting and a listing of participants are available at http://www.ich.ucl.ac.uk/ich/academicunits/general_and_adolescent_paediatrics/Lancet%20Adolescent%20health%20group. The authors would like to acknowledge the helpful comments of many of those participants on this manuscript. We would particularly like to acknowledge the very helpful comments of the Journal reviewers. G.C.P. is supported by a Senior Principal Research Fellowship from Australia's National Health and Medical Research Council.

The authors of this manuscript have worked on behalf of the group (listed in the appendix), who met at the Institute of Child Health in London in September 2009.

Appendix

List of Participants in the London Meeting: Melanie Abas, UK; Helen Amdemikael, UNFPA; Shanthi Ameratunga, New Zealand; Ayaga Bawah, INDEPTH network, Ghana; Linda Bearinger, USA; Dominique Behague, Brazil; Glenn Bowes, Australia; Bob Blum, USA; Fusun Cetin, Turkey; Mick Creati, Australia; Tony Costello, UK; Candace Curry, HBSC, UK; Simon Denny, New Zealand; Alex Ezeh, Kenya; Adesegun Fatusi, Nigeria; Jane Ferguson, WHO; Ersheng Gao, China; Dagmar Haller-Hester, Switzerland; Therese Hesketh, UK; Charlie Irwin, USA; Jaya, UNFPA, India; Sabine Kleinert, UK; Linh Le Cu, Vietnam; Ximena Luengo, Chile; Aidan McFarlane, UK; Pierro-Andre Michaud, Switzerland; Sally-Ann Ohene, WHO, Ghana; Elizabeth Ozer, USA; Vikram Patel, India; George Patton, Australia; Sheena Reilly, Australia; Michael Resnick, USA; Leanne Riley, WHO, GSHS; David Ross, UK; Lena Sancu, Australia; John Santelli, USA; Sawyer Susan, Australia; Shyam Thapa, WHO; Venkatraman Chandra-Mouli, WHO; Russell Viner, UK.

References

- [1]. Beaglehole, R.; Bonita, R. Public health at the crossroads. 2nd edition. Cambridge, UK: Cambridge University Press; 2004.
- [2]. Brosco JP. The early history of the infant mortality rate in America: "A reflection upon the past and a prophecy of the future". *Pediatrics*. 1999; 103:478–85. [PubMed: 9925845]
- [3]. Caldwell JC. Population health in transition. *Bull World Health Organization*. 2001; 79:159–60.
- [4]. Hogan MC, Foreman KJ, Naghavi M, et al. Maternal mortality for 181 countries, 1980–2008: A systematic analysis of progress towards millennium development goal 5. *Lancet*. 2010; 375:1609–23. [PubMed: 20382417]
- [5]. World Bank. World development report 2007: Development and the next generation. 2007. Available at: <http://www.worldbank.org/reference/>
- [6]. Larson R. Globalization, societal change, and new technologies: What they mean for the future of adolescence. *J Res Adolesc*. 2002; 12:1–30.
- [7]. Alderman EM, Rieder J, Cohen MI. The history of adolescent medicine. *Pediatr Res*. 2003; 54:137–47. [PubMed: 12672903]
- [8]. Dahan M, Tsiddon D. Demographic transition, income distribution, and economic growth. *J Econ Growth*. 1998; 3:29–52.
- [9]. Temin, M.; Levine, R. Start with a girl: A new agenda for global health [A girls count report on adolescent girls]. Washington, DC: Centre for Global Development; 2009. Available at: <http://www.cgdev.org/content/publications/detail/1422899/>
- [10]. Panel on Transitions to Adulthood in Developing Countries. Growing up global: The changing transitions to adulthood in developing countries. Washington, DC: National Academy of Sciences; 2005.
- [11]. Board on Children Young People and Families. Adolescent health services: Missing opportunities. Washington, DC: Institute of Medicine, National Academy of Sciences; 2009.
- [12]. [Accessed April 20] Beyond mortality: Future perspectives in adolescent health. 2010. Available at http://www.ich.ucl.ac.uk/ich/academicunits/general_and_adolescent_paediatrics/Lancet%20Adolescent%20health%20group
- [13]. Patton GC, Coffey C, Sawyer SM, et al. Global patterns of mortality in young people: A systematic analysis of population health data. *Lancet*. 2009; 374:881–92. [PubMed: 19748397]
- [14]. Peden, M.; Oyegbite, K.; Ozanne-Smith, J., et al., editors. World report on child injury prevention. Geneva, Switzerland: WHO UNICEF; 2008. Available at: http://www.who.int/violence_injury_prevention/child/injury/world_report/en/index.html
- [15]. Maselko J, Patel V. Why women attempt suicide: The role of mental illness and social disadvantage in community cohort in India. *J Epidemiol Community Health*. 2008; 62:817–22. [PubMed: 18701733]
- [16]. Krishnan S, Rocca CH, Hubbard AE, et al. Do changes in spousal employment status lead to domestic violence? Insights from a prospective study in Bangalore, India. *Soc Sci Med*. 2010; 70:136–43. [PubMed: 19828220]
- [17]. Shaikh BT, Hatcher J. Health seeking behaviour and health service utilization in Pakistan: Challenging the policy makers. *J Public Health (Oxf)*. 2005; 27:49–54. [PubMed: 15590705]
- [18]. Clark S, Bruce J, Dude A. Protecting young women from HIV/AIDS: The Case against child and adolescent marriage. *Int Fam Plan Perspect*. 2006; 32:79–88. [PubMed: 16837388]
- [19]. Hindin MJ, Fatusi AO. Adolescent sexual and reproductive health in developing countries: An overview of trends and interventions. *Int Perspect Sex Reprod Health*. 2009; 35:58–62. [PubMed: 19620089]
- [20]. Michaud, PA.; Venkatraman, CM.; Patton, GC. Adolescent health. *Oxford Textbook of Public Health*. Detels, R.; Beaglehole, R.; Lansang, MA., et al., editors. Oxford, UK: Oxford University Press; 2009. p. 1452-64.
- [21]. Lopez AD, Mathers CD, Ezzati M, et al. Global and regional burden of disease and risk factors, 2001: Systematic analysis of population health data. *Lancet*. 2006; 367:1747–57. [PubMed: 16731270]

- [22]. Patel V, Flisher AJ, Hetrick SE, McGorry PD. Mental health of young people: A global public-health challenge. *Lancet*. 2007; 369:1302–13. [PubMed: 17434406]
- [23]. Stein C, Kuchenmuller T, Hendrickx S, et al. The global burden of disease assessments—WHO is responsible? *PLoS Negl Trop Dis*. 2007; 1:e161. [PubMed: 18160984]
- [24]. Working together for health: World health report 2006. Geneva, Switzerland: World Health Organization; 2006. Available at: <http://www.who.int/whr/2006/en/>
- [25]. Gray GE. Adolescent HIV—cause for concern in Southern Africa. *PLoS Med*. 2010; 7:e1000227. [PubMed: 20161804]
- [26]. Dandona R, Anil KG, Ameratunga S, Dandona L. Road use pattern and risk factors for non-fatal road traffic injuries among children in urban India. *Injury*. in press.
- [27]. Hawkins JD, Kosterman R, Catalano RF, et al. Promoting positive adult functioning through social development intervention in childhood: Long-term effects from the Seattle social development project. *Arch Pediatr Adolesc Med*. 2005; 159:25–31. [PubMed: 15630054]
- [28]. Patton GC, Bond L, Carlin JB, et al. Promoting social inclusion in schools: A group-randomized trial of effects on student health risk behavior and well-being. *Am J Public Health*. 2006; 96:1582–7. [PubMed: 16873760]
- [29]. Currie C, Nic GS, Godeau E. International HBSC Network Coordinating Committee. The health behaviour in school-aged children: WHO collaborative cross-national (HBSC) study: Origins, concept, history and development 1982–2008. *Int J Public Health*. 2009; 54:S225–34.
- [30]. Currie, C.; Gabhainn, S.; odeau, E., et al., editors. Inequalities in young people's health: Health behaviour in school-aged children international report from the 2005/2006 survey. Copenhagen, Denmark: WHO; 2008. Available at: http://www.euro.who.int/data/assets/_file/0005/53852/E91416.pdf
- [31]. Warren CW, Jones NR, Peruga A, et al. Global youth tobacco surveillance, 2000–2007. *MMWR Surveill Summ*. 2008; 57:1–28. [PubMed: 18219269]
- [32]. [Accessed April 20, 2010] International network for the demographic evaluation of populations and their health in developing countries (INDEPTH). Available at: <http://www.indepth-network.org/>
- [33]. Armstrong T, Bonita R. Capacity building for an integrated noncommunicable disease risk factor surveillance system in developing countries. *Ethn Dis*. 2003; 13(Suppl 2):S13–8. [PubMed: 13677407]
- [34]. Yu P, de Courten M, Pan E, Galea G, Pryor J. The development and evaluation of a PDA-based method for public health surveillance data collection in developing countries. *Int J Med Inform*. 2009; 78:532–42. [PubMed: 19369114]
- [35]. Survey Assessment of Vietnamese Youth (SAVY). 2005. Available at: http://www.unicef.org/vietnam/media_2383.html
- [36]. International Institute for Population SciencesMaPCND. Youth in India: Situation and needs 2006–2007. 2010. ed. Available at: http://www.popcouncil.org/pdfs/2010PGY_YouthInIndiaReport.pdf
- [37]. Pirkis JE, Irwin CE, Brindis C, et al. Substance use by US and Australian students: Beware international comparisons. *J Adolesc Health*. 2003; 33:279–86. [PubMed: 14519570]
- [38]. Mmari K, Blum RW. Risk and protective factors that affect adolescent reproductive health in developing countries: A structured literature review. *Glob Public Health*. 2009; 4:350–66. [PubMed: 19462269]
- [39]. Shiffman J. A social explanation for the rise and fall of global health issues. *Bull World Health Organization*. 2009; 87:608–13.
- [40]. Due P, Holstein BE, Soc MS. Bullying victimization among 13 to 15-year-old school children: Results from two comparative studies in 66 countries and regions. *Int J Adolesc Med Health*. 2008; 20:209–21. [PubMed: 18714557]
- [41]. Murray CJ. Towards good practice for health statistics: Lessons from the millennium development goal health indicators. *Lancet*. 2007; 369:862–73. [PubMed: 17350457]
- [42]. Greenwood BM, Bhasin A, Bowler CH, et al. Capacity strengthening in malaria research: The Gates malaria partnership. *Trends Parasitol*. 2006; 22:278–84. [PubMed: 16725373]

- [43]. Mayhew SH, Doherty J, Pitayarangsarit S. Developing health systems research capacities through north–south partnership: An evaluation of collaboration with South Africa and Thailand. *Health Res Policy Syst.* 2008; 6:8. [PubMed: 18673541]
- [44]. Chandiwana S, Ornbjerg N. Review of North–South and south-south cooperation and conditions necessary to sustain research capability in developing countries. *J Health Popul Nutr.* 2003; 21:288–97. [PubMed: 14717574]
- [45]. The Consortium for Advanced Research Training in Africa (CARTA). [Accessed April 20, 2010] Available at: <http://www.aphrc.org/insidepage/?articleid=417>
- [46]. Blum RW, Nelson-Nmari K. The health of young people in a global context. *J Adolesc Health.* 2004; 35:402–18. [PubMed: 15488435]
- [47]. Mathews C, Guttmacher SJ, Flisher AJ, et al. The quality of HIV testing services for adolescents in Cape Town, South Africa: Do adolescent-friendly services make a difference? *J Adolesc Health.* 2009; 44:188–90. [PubMed: 19167669]
- [48]. Akpabio II, Asuzu MC, Fajemilehin BR, Ofi AB. Effects of school health nursing education interventions on HIV/AIDS-related attitudes of students in Akwa Ibom State, Nigeria. *J Adolesc Health.* 2009; 44:118–23. [PubMed: 19167659]
- [49]. Diclemente RJ, Crosby RA. Preventing HIV among adolescents in sub-Saharan Africa. *J Adolesc Health.* 2009; 44:101–2. [PubMed: 19167656]
- [50]. Patel V, Kim YR. Contribution of low- and middle-income countries to research published in leading general psychiatry journals, 2002–2004. *Br J Psychiatry.* 2007; 190:77–8. [PubMed: 17197661]
- [51]. Keiser J, Utzinger J, Tanner M, Singer BH. Representation of authors and editors from countries with different human development indexes in the leading literature on tropical medicine: Survey of current evidence. *BMJ.* 2004; 328:1229–32. [PubMed: 15059851]
- [52]. Horton R. A new global commitment to child survival. *Lancet.* 2006; 368:1041–2. [PubMed: 16997646]
- [53]. Kleinert S. Adolescent health: An opportunity not to be missed. *Lancet.* 2007; 369:1057–8. [PubMed: 17398287]
- [54]. Child health epidemiology reference group. 2010. Available at: http://www.who.int/child_adolescent_health/data/cherp/en/index.html
- [55]. Partnership for maternal, newborn and child health. 2010. Available at: <http://www.who.int/pmnch/en/>
- [56]. Coalition for adolescent girls. 2010. Available at: <http://www.coalitionforadolescentgirls.org/about>