

*Disease Control Priorities: 3rd Edition*  
*Volume 3: Child and Adolescent Development*

**Summary of Outcomes from the Child and Adolescent Development Workshop,  
Palm Springs, February 11-12, 2014**

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**Contextual Background to the Workshop:**

Volume 3 is focused on the issues of Child and Adolescent Development. Part 2 of this volume is intended to provide a conceptual framework for the volume by presenting evidence of opportunities and challenges for intervention at different stages along the life course (nominally defined as: preschool, school age, and adolescence), including any evidence of costs, return on investment and implications for trade-offs. The February 2014 workshop in Palm Springs brought together economists as well as technical experts on growth and cognitive development across the life course (see Appendix 1 for list of participants) in order to inform the development of Volume 3 in general and Part II in particular (see Appendix 2 for agenda). The dialogue sought to clarify the relative cost, benefits and trade-offs for interventions that have demonstrated impact on cognition or physical growth along the life course, and to use this to develop a conceptual framework.

The workshop objectives were to (1) Explore evidence for opportunities for intervention in growth and cognition at different ages (preschool, school-age, and adolescence); (2) Determine, where possible, the costs and returns on investment, and important trade-offs from intervening at different stages of the life cycle; and (3) Provide guidance, especially to coordinating authors and co-authors, on steps to finalize the chapters subsequent to the workshop.

The workshop focused on two issues: A) the development of the conceptual framework and how that would be presented in Part 2 of the volume, and B) the implications of the discussions more generally for the 5 Parts of Volume 3. This Summary follows the same division.

**A) Framework, Organization, and Action Items for the Conceptual Framework (Part 2):**

Through moderated presentations and discussions, participants reached broad agreement on terminology, scope, and areas of research for the Conceptual Framework for Volume 3.

**Some Concepts Informing the Framework:**

- There is a continuum of development during the life course, during which intervention at any stage may offer benefit, although sometimes qualified benefit
- The divisions preschool, school age, and adolescence, while useful in identifying platforms for intervention and for emphasizing that different types of development occur at different ages, have contributed to a lack of nuance in viewing child development as a continuum.
- The “irreversibility” of developmental consequences of early insult has sometimes been misleadingly presented or over-emphasized: in practice, while complete reversibility may be difficult to achieve, later intervention may significantly reverse the consequences and offer significant benefit
- While early (i.e. “preventive” and “upstream”) intervention is likely to be particularly effective with some outcomes, others require intervention at a later stage or age: for example:

- Effectiveness of interventions is development stage-specific: e.g. intervention for adolescent behaviors cannot usefully occur before adolescence; different phases of cognitive development occur in sequence throughout the life course.
- Effectiveness of interventions is life course stage-specific e.g. physical growth after the early years is critically dependent on the timing of intervention relative to puberty.
- Intervention may itself change the life course and the optimal timing of intervention: e.g. the lability of time of puberty.
- Terms such as “second chance” and “remediation” for intervention later in the life course are not value-neutral and have discouraged useful interventions.
  - Later age “catch-up” in growth and cognitive development may fall short of achieving full genetic potential yet still provide significant benefit.
  - There needs to be balance between presenting the potential hazards of later interventions versus the potential benefits e.g. with school feeding, the risks of promoting obesity vs the benefits of growth.

#### Organizing Principles for Part 2:

- There will be a single chapter laying out the concepts and exploring relative cost-effectiveness analysis/benefit-cost analysis of intervention at different stages in the life course, and including both growth and cognition as key outcomes.
- The focus will be on growth and development from ages 0-19, the more commonly used upper age limit for adolescence, although it is recognized that development continues beyond this point (e.g. brain development completes around 25 years of age).
- The conceptual chapter will present key evidence to support the contentions. However, due to the substantial body of evidence it will also be necessary to reference evidence presented: in up to 2 separate “evidence Chapters” in Part 2; relevant chapters in Part 3; other volumes of DCP3.
- The conceptual chapter will describe a continuum of development across the life course from the pre-conception health status of the mother, with age or development-specific staging (see Indicative Figure 1: Patterns of Development of the Life Course).
- The chapter will estimate the evidence of benefits and hazards from interaction at different stages in the life course.

#### Agreed Actions for the Writing and Review of Part 2:

- The conceptual chapter will be written jointly by Harold Alderman, Paul Glewwe, and Jere Behrman. An outline will be prepared by the end of February for contributions by other participants:
  - Early Development: Lia Fernald, Sue Horton, and Carol Medlin
  - School age: Kristie Watkins, Andreas Georgiadis, Elena Grigorenko, Lesley Drake, Daniel Plaut, Donald Bundy
  - Adolescents: George Patton, Susan Sawyer, Zulfiqar Bhutta
  - Costs: Carol Levin
- Editorial oversight will be by Donald Bundy and Sue Horton, with the latter focusing on the cost-effective analysis/benefit-cost analysis from a perspective of feasibility and equity.

#### **B) Beyond Part 2 - Agreed Revisions to the Volume 3 Structure:**

The discussions during the workshop identified the following changes in specific areas elsewhere in Volume 3.

- *Chapter 1, Volume Introduction:* The introduction will include a summary of the conceptual framework for child and adolescent development based on Part 2. The introduction will also include an estimate of how much it would cost to create a “grand convergence” for children in

low income countries benchmarked against the development achieved in middle income countries. This estimate would follow the example of the *Lancet Commission on Investing in Health*.

- *Action Item:* Dean Jamison to discuss with Volume Editors the best way forward to conduct this analysis.
- *Part 1, Chapters 2-3:* Although Part 1 aims to cover the burden of disease as currently formulated, it currently addresses mortality only. Therefore it was agreed to develop at least one new chapter on the burden of morbidity focusing on areas for which global primary metrics of morbidity data are available in this age-group, especially the anthropometrics and education achievement across countries (TIMMS, PISA) as well as chronic illness, and other areas where suitable primary metrics of morbidity were available for this age group, especially in time series comparative data).
  - *Action Item:* Volume Editors to identify authors for this new chapter and seek advice on inter-country comparative data.
  - *Action Item:* Susan Sawyer to advise on chronic disease data.
- *Part 3, Chapters 6-11:* School feeding and deworming chapters (Chapters 7 and 8) should relate their findings to the context of local needs. In the case of school feeding, by mapping against food security and in the case of deworming by mapping against prevalence/incidence of worm infections. This should follow models developed for other purposes e.g. by Zulfiqar Bhutta.
  - *Action Item:* Lesley Drake (school feeding) and Simon Brooker (deworming) to lead analyses in respective chapters and to establish liaison with Zulfiqar Bhutta's research team.
- *Part 3, Continued:* The workshop had a teleconference on mental health with James Scott, a lead author on the prevention of childhood behavioral disorders for Volume 8. He described planned analysis for Volume 8 on emotional, childhood behavioral and developmental disorders, all from high income countries. It was agreed that authors of adolescent health in Volume 3, Part 4, especially George Patton, will liaise with Volume 8, and a) consider whether there is a need for a mental health chapter in Volume 3, Part 3, and b) ensure that Volume 3 appropriately references the material in Volume 8.
  - *Action Item:* George Patton to liaise with James Scott.
  - *Action Item:* Donald Bundy to liaise with Vikram Patel regarding the proposed inclusion of mental health benefits of improved nutrition and cognitive development in childhood in Volume 3.
- *Part 3, Continued:* The section on disability (Chapter 11) should consider how to meet the schooling needs of children with special needs, particularly as research within the previous decade has expanded to include autism and differentiated learning needs.
  - *Action Item:* Donald Bundy to liaise with Elena Grigorenko.
- *Part 4, Chapters 12-16:* Daniel Plaut gave a presentation on behalf of Nicholas Burnett from Results for Development Institute (Chapter 14). The principle approach is well established, and now requires specific technical input, particularly for health interventions. The presentation was well received, in particular, the use of Tableau bubble graph software. This presentation of results was identified as a resource that should be given prominence on the DCP3 website.
  - *Action Item:* Editors to establish reference group of selected lead authors from Part 3 to serve as a resource for the Chapter 14 team.
- *Part 4, Continued:* Physical activity will be incorporated into the chapter on school as a platform for addressing health (Chapter 13). Physical activity is important to include as levels of physical activity declines at the same period where the protective factor begins.
  - *Action Item:* Donald Bundy to incorporate physical activity into Chapter 13.
- *Part 5, Chapters 17-20:* It was agreed that the chapter on interventions with adolescent girls (Chapter 19) would be expanded to include extended-cost effectiveness analysis.

- *Action Item:* Donald Bundy will have an early discussion with Stephane Verguet, Anthony Seddoh, Dean Jamison, Christopher Fitzpatrick, and experts in adolescent family planning/reproductive health to define the adolescent girl interventions to be analyzed by ECEA.

**Overarching Strategy across Volumes:**

- *Duplication across Volumes:* One important issue was managing content in this volume and across volumes. It was agreed that the guiding principle would be to prefer duplication over omission. Key to this is ensuring good communication so that authors are aware of content in other chapters and volumes.
  - *Action Item:* Rachel Nugent will connect chapter authors with authors from relevant chapters and volumes so that authors can make parallel linkages where necessary.
  - *Action Item:* Donald Bundy to discuss with D. Prabhakar and Caroline Fall whether to move their chapter on Early Origins of Disease to from Volume 5 to Volume 3. Donald Bundy will report back to Volume Editors.

**Actions with Other Partners:**

- *Carol Medlin, CIFF:* Will discuss with colleagues whether there are specific areas of this Volume where CIFF may be interested in commissioning analytical work.
- *Luca Passerini, Bill and Melinda Gates Foundation: Relevant colleagues at the BMGF (including Damien Walker and Mariam Claeson),* will explore the possibility of hosting a meeting in Seattle for Volume 3 authors and editors, potentially in September. Luca Passerini will share potential dates by the end of February.
- *George Patton:* George Patton will explore with the *Lancet Commission on Adolescent Health* potential areas of synergy with Volume 3.

**Submission Timelines:**

Please share all chapters with Linda Schultz and Donald Bundy by the following dates:

- *March 2014:* Final author review for fast track chapters
- *August 2014:* Final author review for regular track chapters
- *November 2014:* Final author review for slow track chapters
- *Mid-2015:* Anticipated DCP3 publication

**Appendix 1: Participant List**

| <b>Last Name</b> | <b>First Name</b> | <b>Affiliation</b>        | <b>Location</b> | <b>Email Address</b>               |
|------------------|-------------------|---------------------------|-----------------|------------------------------------|
| Alderman         | Harold            | IFPRI                     | DC              | h.alderman@cgiar.org               |
| Behrman          | Jere              | U. Pennsylvania           | Philadelphia    | jbehrman@econ.upenn.edu            |
| Bhutta           | Zulfiqar          | Aga Khan University       | Karachi         | zulfiqar.bhutta@aku.edu            |
| Brouwer          | Elizabeth         | U. Washington             | Seattle         | ebrouwer@uw.edu                    |
| Bundy            | Donald            | World Bank                | DC              | dbundy@worldbank.org               |
| Drake            | Lesley            | PCD                       | London          | lesley.drake@imperial.ac.uk        |
| Fernald          | Lia               | U. California, Berkeley   | Berkeley        | fernald@berkeley.edu               |
| Georgiadis       | Andreas           | Oxford University         | Oxford          | andreas.georgiadis@qeh.ox.ac.uk    |
| Glewwe           | Paul              | U. Minnesota              | St. Paul        | pglewwe@umn.edu                    |
| Grigorenko       | Elena             | Yale University           | New Haven       | elena.grigorenko@yale.edu          |
| Horton           | Sue               | U. of Waterloo            | Ontario         | sehorton@uwaterloo.ca              |
| Jamison          | Dean              | DCP/UW                    | Seattle         | djamison@uw.edu                    |
| Levin            | Carol             | DCP/UW                    | Seattle         | clevin@uw.edu                      |
| Makinen          | Martin            | Results for Development   | DC              | mmakinen@r4d.org                   |
| Medlin           | Carol             | CIFF                      | London          | cmedlin@ciff.org                   |
| Nugent           | Rachel            | DCP/UW                    | Seattle         | rnugent2@uw.edu                    |
| Passerini        | Luca              | Gates Foundation          | Seattle         | luca.passerini@gatesfoundation.org |
| Patton           | George            | Royal Children's Hospital | Melbourne       | george.patton@rch.org.au           |
| Plaut            | Daniel            | Results for Development   | DC              | dplaut@r4d.org                     |
| Sawyer           | Susan             | Royal Children's Hospital | Melbourne       | susan.sawyer@rch.org.au            |
| Schultz          | Linda             | World Bank                | DC              | lschultz@worldbank.org             |
| Scott            | James             | U. Queensland             | Brisbane        | James.Scott@health.qld.gov.au      |
| Verguet          | Stephane          | U. Washington             | Seattle         | verguet@uw.edu                     |
| Watkins          | Kristie           | PCD                       | London          | kristie.watkins@imperial.ac.uk     |

## **Appendix 2: Meeting Agenda**

### **DCP3 AGENDA: VOLUME 3, PART II**

#### **Causal Links between Risk Factors, Interventions, and Outcomes at Different Stages of Child and Adolescent Development**

#### **Meeting with Editors, Coordinating Authors, Co-Authors, and Experts**

**Background:** Volume 3 of the Disease Control Priorities series focuses on Child and Adolescent Development, emphasizing the longer run consequences of chronic illnesses and malnutrition on growth and cognitive development. An important Bellagio meeting 25 years ago originally extended the focus from child survival, to child development. One important issue is the relative benefits of interventions at different ages (preschool, school-age and later adolescence).

Part II of the volume contains two chapters: (1) Growth and Development and (2) Cognition and Development. The chapters will present evidence of opportunities for intervention in these areas for different age groups, including any evidence of costs, return on investment and implications for trade-offs. The discussions in Part II will serve as a conceptual framework for the Volume.

This workshop brings together experts on both growth and cognitive development in order to inform the development of Part II.

**Method of Working:** Subchapter authors draft papers before the workshop. Coordinating authors will work with subchapter authors after the workshop to finalize the chapters.

**Length:** Each chapter will be a maximum of 10,000 words, with 2,500 words allocated to each of the 3 subchapters, and 2,500 words from the Coordinating Author to cover Introduction, Summary, and Conclusion.

#### **Meeting Objectives:**

- Explore evidence for opportunities for intervention in growth and cognition at different ages (preschool, school-age and adolescence)
- Determine, where possible, the costs and returns on investment, and important trade-offs from intervening at different stages of the lifecycle
- Provide guidance, especially to coordinating authors and co-authors, on steps to finalize the chapters subsequent to the workshop

February 21, 2014

Donald Bundy, Lead Volume Editor

**DAY ONE: TUESDAY, FEBRUARY 11**

**5:30 PM – 8:00 PM**

**Transportation from Palm Springs Airport to Desert Princess Resort by hotel shuttle**

1:00 pm - 5:00pm

**Transportation to Dean Jamison's home via hotel shuttle**

5:00 pm - 5:15 pm

**Welcome Reception (heavy hors d'oeuvres will be served)**

Location: Dean Jamison's Residence

5:30 pm – 8:00 pm

**DAY TWO: WEDNESDAY FEBRUARY 12**

**Location: DESERT PRINCESS RESORT, PALO VERDE ROOM**

**8:00 am – 5:00 pm**

**MORNING SESSION:**

Chair: Sue Horton

8:00 am – 12:15 pm

*Registration*

**Information Packets and Breakfast**

8:00 am – 8:30am

*Welcome and Introductions*

**Overview of the 3<sup>rd</sup> Edition of *Disease Control Priorities***

Presenters: Dean Jamison, Rachel Nugent,

8:30 am – 8:45 am

- The nature and objectives of DCP3 and what sets this edition apart
- DCP3 goals, timelines, and deliverables

**Overview of the *Disease Control Priorities, Volume 3 Child and Adolescent Development***

Presenter: Donald Bundy (Volume 3 Lead Editor)

8:45 am – 9:15 am

- Introduce the workshop and participants
- Importance of DCP dedicating a volume to child and adolescent development
- Structure, timelines, and key deliverables of volume
- Update on progress on Volume 3, Part II

*Panel Discussions*

*Format for both panels: Presenters each speak for 10 minutes, followed by moderated group discussion. All workshop participants are encouraged to contribute to the discussion and, if appropriate, make a brief presentation to the group.*

**Panel 1: Evidence on the effect of interventions on physical growth at different stages in the life cycle**

Moderator: Harold Alderman (Coordinating Author)

Panelists: Jere Behrman, Kristie Watkins, and Susan Sawyer

9:15 am – 12:15 pm

- Growth in Preschool Children (Jere Behrman and Harold Alderman)
- Growth in School-age Children (Kristie Watkins, Dean Jamison, and Donald Bundy)
- Growth and Nutritional Status in Adolescents (Susan Sawyer)

**AFTERNOON SESSION:**

Chair: Rachel Nugent

1:30 pm – 5:00 pm

**Panel 2: Evidence on the effect of interventions on cognition and educational achievement at different stages in the life cycle**

Moderator: Paul Glewwe (Coordinating Author)

Panelists: Lia Fernald, Elena Grigorenko, Andreas Georgidis, Zulfiqar Bhutta, and George Patton

1:30 pm – 3:45 pm

- Cognition in Preschool Children (Lia Fernald and Sue Walker)
- Cognition in School-age Children (Elena Grigorenko)
- Cognition and Growth in Adolescence (George Patton and Zulfiqar Bhutta)

**Coffee Break**

3:45 pm – 4:00 pm

*Cross-cutting Issues in Developing Volume 3*

*Presentation Format: Presenters will speak for 10 minutes followed by a 5 minute Q&A*

**Costs of Child Development Interventions**

Presenter: Carol Levin

4:00 pm – 4:15 pm

- DCP mechanisms for undertaking literature reviews of cost interventions, using the example of costs for interventions that reduce the risk in the first 1000 days

**School as a Platform for Education and Child Development**

Presenter: Daniel Plaut

4:15 pm – 4:30 pm

- Exploring cross-sectoral implications: Importance of health interventions for education outcomes

**Child Development, Mental Disorders, and Interventions**

Presenter: James Scott

4:30 pm -4:45 pm

- Exploring the connections between Volume 3 and Volume 8 on *Mental and Neurological Health: Overview of evidence of child development and mental health intervention strategies, including estimated effect sizes*

**Session Wrap-Up**

Presenter: Dean Jamison

4:45 pm – 5:00 pm

**DAY THREE: THURSDAY FEBRUARY 13**

**Location: DESERT PRINCESS RESORT, PALO VERDE ROOM**

**8:30 am – 12:00 pm**

**MORNING SESSION**

Chair: Donald Bundy

8:30 am – 11:00 pm

**Breakfast**

8:30 am – 9:00am

*Feedback and Next Steps*

**Workshop Feedback**

Moderators for Panel 1 and 2: Harold Alderman and Paul Glewwe (Coordinating Authors)

9:00 am - 11:00 am

- Feedback and chapter directions based on panel discussions

**Coffee Break**

11:00 am – 11:15 am

**Next Steps**

Presenter: Dean Jamison (Principal Investigator and Series Editor)

11:15 am – 12:00 pm

- Summary of action items

**Meeting Close**

12:00 pm

**Indicative Figure 1: Patterns of Development of the Life Course**

