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Non-communicable Diseases Consultation: Meeting Summary and Notes

August 8, 2012

JSI Research & Training Institute, Inc. (JSI) • Helen Keller International (HKI) • International Food Policy Research Institute (IFPRI) • Save the Children (SC) • The Manoff Group (TMG)

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MEETING SUMMARY

Objectives:

On August 8, 2012, USAID hosted a consultation on early life nutrition programming and links with later life non-communicable disease (NCD) risk, in order to achieve the following goals:

- Discuss and identify current practices in programming for maternal, infant, and young child nutrition and health that effect long-term NCD risk
- Identify research gaps in determining the impacts of early life undernutrition and NCDs
- Build consensus around the research agenda and programmatic options to explore this topic area
- Discuss SPRING's potential approach to answering one of the research questions identified earlier in the process

Overview:

During the morning session, three experts presented the current state of knowledge and discussed implications for current USAID programming. In the afternoon, SPRING presented an outline for their proposed work modeling NCD risks from undernutrition programming in the first 1,000 days. The final session of the meeting split participants into two groups to discuss the proposed SPRING model, and programming implications, such as increased risk of cardiovascular disease or diabetes.

Findings:

There was general agreement among participants that the role of undernutrition programming in affecting the risk of NCDs has been under-discussed. The relationships that exist between early life programming and later life NCD risk should play a role in the design and implementation of programs aimed at alleviating the burden of undernutrition. As NCDs become more prevalent in developing countries, policy-makers will have to address NCDs and malnutrition simultaneously. The difficulty arises when programming to combat NCDs and malnutrition are in conflict.

Developing countries are seeing a higher prevalence of NCDs, while the burden of the diseases shifts increasingly to the poor. The causes are multifaceted but include the technological changes that have taken place in agriculture, as well as the economic changes in food systems and energy expenditures.

Most growth faltering occurs in the first two years of life, which makes early-life programming especially important in combating the long-lasting effects of undernutrition. To a large extent, programming has focused on underweight, but increased weight gain may actually add to the risk of future NCDs. These increased risks can be passed from one generation to the next, resulting in a situation where overnutrition and its related diseases predominates. Recent research has shown that the effect on NCD risks of growth varies by age and by what type of growth measurement is used. Overall, linear growth in the first six months is a key determinant of adult height, more so than weight gain.

Measuring weight poses a problem for tackling the double burden of disease. While there is growing consensus that measuring weight does not adequately depict the undernutrition situation and can even promote interventions that increase NCD risks, practices are slow to change. Though stunting is a measure that more accurately reflects undernutrition and provides better guidelines for programming that does not increase NCD risk, field-friendly tools and methods of measuring height are not widely available.

Programs that improve linear growth have not yet had measurable impact. Protein intake guidelines have not been developed for infants and young children. Dietary guidelines for the birth to two year age group are missing in developed countries, creating a clear gap. While the 1000 days period is critical for early-life development and later NCD risks, adolescence also plays an important role, and there is very little programming aimed at this age group.

The risk factors for NCDs are showing up earlier and earlier. Modeling based on health costs beginning at age 35 might not provide the most accurate picture; however, most data regarding NCDs are only available for this age range. Models of the relationships between early life interventions and NCD risk will have to reflect the data that is currently available. There will also be a great deal of uncertainty around costs and environmental changes that may affect the relationships and final findings of the model. Sensitivity analysis will allow researchers to take the uncertainty into account.

Next Steps:

Meeting participants agreed to continue strategic development of undernutrition programming in the first 1000 days that takes into account the role that such programs play in creating NCD risk. SPRING agreed to continue working with experts to define and shape the risk modeling work based on discussions during the meeting.

MEETING NOTES

Opening Remarks by Dr. Ariel Pablos-Mendez, USAID

- With the fall of colonialism, tropical medicine became international health. At the end of Cold War, the discipline became global health. Global health needs to continue to change the way it works.
 - Countries have to look at transforming their public health systems
 - USAID also needs to change - One way is leveraging private sector which is playing a larger role
 - Need to define an 'end game' for nutrition
- We have been experiencing the epidemiological transition for a while; there has been an awareness change as well. NCD and injuries will be two big areas for international health going forward. Tobacco and obesity are drivers in NCDs.
- The problem is just now emerging but budgets are flat. USAID is trying to see how to leverage what they already do: DHS will continue and expand tracking of NCDs, there will be a focus on using communication for behavior change.
- The world of nutrition seems to be split in 2 groups: those working against over nutrition or under nutrition. This shouldn't be the case.
- USAID is particularly interested in early life imprinting of nutrition programs and will use its experience to make the link between early nutrition and NCDs explicit. Also want to get a sense of economic impact.

Discussion after Dr. Barry Popkin's presentation

- USAID has been focused on under-nutrition, so obesity adds complexity. We need to set the stage for what we know and don't know:
 - A parallel phenomenon is size of poor families. You now have much larger families—but after a generation or two fertility rates fall.
 - In poor setting, obesity was a sign of being rich, but with the transition we can expect behaviors to change.
 - Developmental origins of adult chronic disease are key: how can we fight malnutrition and prevent adult obesity? Some of our feeding may be creating problems.
- Infection needs to be part of the discussion—has an impact on clinical and health systems. HIV example: in many populations, HIV is super-imposed on population that is already at risk for NCDs. How we care for this will be a problem. Use of computational modeling has been explored at NIH.
- Measurement is very complicated: socio-economic grading, calorie consumption, physical activity.
 - Malnourishment among female teenagers becomes inter-generational. How do we deal with young girls so babies will not be on a low birth weight trajectory?
 - Modeling must be sensitive to the biology and are only as good as the data that goes in. We often don't have the cohort studies necessary to create robust models. Cohorts need to be monitoring a number of variables, and we don't currently have the datasets to do the projects properly.
 - Need to think about implications of measuring BMI vs. type of body fat.
 - Similarly, we often don't have the data for infectious diseases. Outside of Africa, we don't know a lot about this confluence.

- Types of growth and feeding will have an effect on NCD outcomes.
- Because of the biology and changes we are having a lot of trouble studying the links because we can't use US assumptions to discuss these issues. We know a lot about the differences in biology and body composition, there have been careful metabolic studies. Data is out there but hasn't been put together, and we don't often discuss it.
- We will need to come back to the issue of health systems. (Dr. Raiten: This will be a theme in the next micronutrient forum.)
- Food systems:
 - often move too fast for programming to keep up
 - There is a role for agriculture. Many groups still focus on ag-productivity, forgetting about the interplay with businesses, though the programs are starting to talk to each other
 - Convenience stores/supermarkets are playing a much larger role that we don't often recognize
 - This is an issue of trade and how it grows
 - This conversation has been absent from FtF, but needs to be present

Discussion after Dr. Adair's Presentation

- Cohort findings have not been stratified by energy intake. Caloric intake is highly correlated with body size; we don't want to find ourselves analyzing the effect of growth on body size.
- Programs to improve linear growth have very little impact. They are not very successful, and we have to consider infectious disease. If there is malabsorption of nutrients, we see very little effect, so now there are water and sanitation or antibiotic treatments along with micronutrient supplementation.
- People worry there is too much measurement error when we look at linear growth, but we need to move to monitoring linear growth because of all its benefits.
 - People are trying to develop field-friendly ways to measure body composition, but we are still using the same tools. Some new tools are field friendly, but many are more useful for research than implementation.
- There is not yet a consensus on protein intake—it has been largely ignored.
 - The German papers look at the amount of optimal protein intake—which is much lower than the amount currently in weaning food.
 - A European group is looking at recommending lower protein for formula.
 - It would be interesting to see how diet in cohorts compares to WHO complementary feeding guidelines. This has not yet been done, but could be done with Cebu data.
 - Animal products are important for micronutrients, as well, not just the protein.

General recommendations outside of EBF from Dr. Adair:

- Avoiding protein excess, looking at fat composition (not just N-6), and micronutrient density.
- There are gaps in what groups have studied on these post-6 months questions. Upcoming work should start to fill this gap.

Discussion after Dr. Forrester's Presentation

- Dr. Pablos-Mendez: A lot of this confirms what USAID is already doing. For the first time in history, we are producing more food than we consume. We have moved from famine to feast, this is the transition. After a few generations, will we see children being less likely to be obese simply as a result of this transition?
 - Dr. Forrester: It would take 6 generations to eliminate the famine-supporting phenotype.
- Problem in mid- and low-income countries will really be the costs, which brings immediacy to question of do we just allow Darwinian selection. Left alone, obesity will fall.
 - Problem is that we have overwhelmed health systems and the obese who survive will lead this phenotype to be the new norm. Countries cannot ignore these costs long term. Some places have even seen mortality rates go up.
 - This calls for a different way of handling resources for health. USAID is looking increasingly at health systems.
- We talk about the economic transition, but not the food transition. How do we get healthy food at an affordable price to low-income populations? What mechanisms do we use?
 - Concern is trying to reduce unhealthy habits while increasing healthy ones. First is easier than the last. Even if we find the right answer, implementation is hard—mothers will start buy biscuits instead of fruits. Mothers need to make the choice to consume and feed it to the child. But we don't know how to do this yet.
 - Industry will adjust; robustness of science with market will change people's demand. We are in the midst of this. [Question from the group: will industry actually adjust if left on its own? Perhaps a role for government legislation?]
 - The lens is how to work on nutrition in early days. Use this to explain that by acting now we can save lives and resources in the future.
- We need to do an assessment of where we are. There are no dietary guidelines for Americans from pregnancy to age 2. This process is now starting. We are rolling out standards for low and middle income countries without having standards for the US. WHO is now joining USDA and HHS in developing nutritional guidelines. A lot of the evidence is poor quality; there is an effort being made to assess the evidence.
 - WHO is looking to reform complementary feeding guidelines looking at the risk of NCDs. This revision could contribute to development of American guidelines. WHO is involved in the US effort.
- We know to promote EBF for first 6 months, but we aren't doing enough in post-6 months period. We haven't dealt with adolescent question. 1000 days ignores adolescence.
 - Maybe by looking at population pyramids, we can find a way to target our activities?
 - There is potential to work through the education system, but we must be careful not to overburden primary school teachers. Part of the complexity is what they can educate versus what is going on around them. For example, with media, it is hard to be heard in the context of the media that already exists. Understanding of the media has changed—this affects what can be done in school.

- You can know what to eat, but it's not available. Example: foods available to adolescent girls are poor quality, even though education is good and adolescent girls know what they are supposed to eat. Education can only go so far—it is an economics question.
- There were breastfeeding resources in the 80s, but now, little support exists for promoting and expanding breastfeeding. LMS work in DRC is happening. These areas are where we should put our efforts.
- Measurement issues:
 - The issue is adiposity not BMI for risk (for children and adults). Whether or not we see a trend with BMI might not be the best way to discuss these relationships.
 - BMI is the most field-friendly. Body fat and BMI are overlapping, and BMI is very bad for children. BMI is more reliable post-menarche, but pre-5 it is a very bad measure.
 - BOND program is going into looking at bio-markers of growth.
 - Use of WAZ instead of linear growth is a problem and we've known for a while. We know about weight vs. height, but we still focus on weight. We are doing things correctly, but there are other things we should change.
- Advocacy is the first obstacle: Many governments don't know about the problem.
 - There is controversy around new WHO recommendation that says we can't put health/nutrition information on baby food. We need to look at the regulations and how we can help countries get better food information out.
 - Countries are moving to have healthy and healthy foods. Infant part has been left out because we don't actually know what is health or not healthy. We see bottled/powdered weaning foods emerge, and we don't have guidelines.
 - We also lack labeling guidelines.
 - Experience with legislation has been mixed. Some successes but haven't really been able to push forward. There are other routes outside of legislation.
- When economic/health systems pressures get high, then the governments begin to act. But 0-2 years, nothing is happening. We haven't known how to touch it.

Discussion after Dr. Stevens and Ms. Pomeroy's Presentation

- What if health costs happen earlier? Starting at age 35 may not be correct—risk factors are changing. Asia is facing NCDs younger and younger.
 - The model reflects the data available—we can't model data for future risk factors, but we also see piles of data around key age groups (children, >35, etc.)
- Many estimates of low birth weight on adult risk factors vary greatly when you adjust for adult size. Have to take into consideration what they are undergoing in the intervening years.
 - Rather than looking at dichotomous birth weight groups, look instead at what do we have to do to get 100g of birth weight.
 - May be useful to do this model with and without controlling for obesity to see how it plays out.
- Cancer is not part of the model—do these costs need to be weighted?

- Diabetes and CVD are the bigger proportion of the long-term health costs. The model is trying to look at the most expensive outcomes and stay flexible to incorporate new evidence.
- Wide uncertainty of data will feed into the uncertainty around the cost estimates at the end.
- This model does not take into account trajectories or environmental changes, but during the process, the assumptions can be changed and we can look at the sensitivities.
 - The effect of what happens in the 1000 days is dependent on what happens after the 1000 days. What do you do if the environment does or doesn't change?
 - Effect will likely be relatively small. You can see in the curves of cohorts data—first 1000 days is a small piece of the burden. This underplays the importance of the changes that happen in mid-childhood and the effects of early life are fairly small. You don't save much in terms of NCDs, more in terms of schooling, etc.
 - Protective effects from interventions in 1000 days aren't actually all that large compared to later weight gain. You get a bigger effect if you are able to take into consideration the altered susceptibility. We should model the amplification that will have an effect on later NCD risk.
 - Also to look at the accumulation of the practices. Can we have this accumulation in a model.
- Cost-effectiveness is a ratio. Even though the benefit may be small, costs in early days are extremely cost-effective compared to treatment of NCDs later in life.
- DALYs are based on specific discounting rates; USAID might have other ideas of a better discounting rates.
- A very long term benefit is that being born non-low birth weight allows us to get rid of the low birth weight on her child down the line. Allows us to explain why we intervene during pregnancy instead of some other point of life. Some of the intergenerational pathways have been ignored. This is a cycle of NCDs and low birth weight. There is a benefit in terms of preventing stunting in the next generation.
- How can USAID make the question better? Think about who is this answer for—who is the audience? Maybe asking if the interventions are more or less cost effective downplays the importance.

Discussion in Model Small Group

Abbott, Adair, Egan, Forrester, Fox, Pomeroy, Stevens

- Need a better sense of the role of the pathway, to better delineate subgroups and cohorts. Break populations down into better groups of baseline data and then pull that delineation forward to think about what happens in later life.
- Why is the question about cost? The assumptions you have to make are all very different.
 - Push from American public to show what you are doing is the most effective action possible. It is almost a metaphorical use because the audience is really policy makers and decision makers in country to encourage them to put money in the countries. How do you respond to foreign aid scrutiny?
 - Started by looking at the burden of NCDs and what it costs countries. USAID will never be able to work primarily in NCDs.

- Accountability has become a big question in aid and development. CBA or cost-effectiveness analysis is the way we are able to ration the resources. Also, costs are massively growing, so if improving USAID interventions could slow these NCD costs.
- The foil to early life undernutrition interventions is not treatment of NCDs but rather what is the added effect of the programming to prevalence of NCDs.
- Many interventions have shorter-term benefits, but nutrition programs don't generally have the same timeframe to their benefits. Can we quantify this added benefit?
- Process started with USAID high-impact interventions, then saw the pathways with the most evidence and went back to the interventions that affected these pathways. Still need to have conversations with biologists to see what they think of the pathways and see whether the issues are being over simplified.
- There are 2 key points: Gender and context.
 - Given the same exposures, there is a difference in biological programming. For focusing interventions, there are good reasons for focusing on different gender and age groups. Need to have a conversation on gender for both biology and communication.
 - Context is key, especially when looking at gender, e.g. South Africa vs. China. But would you ask the question if you don't want to know the answer—would we ever develop differential programming for boys and girls in childhood? Definitely not in 1000 days period.
- New question will not be using the comparator to NCD treatment—we will look at what is the value added beyond the programming being done.
- Have to think about discount rates when deciding how far down the line we should be looking? If there is something that doesn't show up until age 40, whether or not it is taken into consideration depends on the discount rates. We run sensitivity analysis, and the discounting has a huge effect on the benefits.
- Measurement issues:
 - Birth weight is a difficult to use. SGA is difficult to get. Gardosi curves (Standardized Fetal Growth Curves) are helpful, but not sure how much data is available to do that.
 - How do we quantify exposure? Quantify the post-natal effects to pick populations with different adult obesity rates.
 - Note: Cohorts group is looking into the possibility of adding another cohort.
 - How do we quantify the degree of the transition?
 - Use rate of change of GDP per capita as proxy for nutrition transition. Can include distribution. Is nutrition a close relationship with both high-balanced GDP growth and high-unbalanced GDP growth?
 - Gini coefficient and GDP are very important but difficult to separate.
 - Another way is to use low birth weight but give a descriptive picture of factors that played a role in nutrition transition.
 - Another possibility of proxy would be oil consumption per person. Also have components asset scores and can use this as a proxy.
 - May be good to use obesity change to see where a country is in the nutrition transition.
 - **From Dr. Popkin:** Best indicators of stage of nutrition transition are difficult to define other than using overweight for women. Oil, calories, etc. are so related to the country context and there is enormous measurement error. Could use annual prevalence change

of overweight, but the stage is closer to the actual level of the overweight. Some countries change diet without changing expenditure.

- Key interventions (Dr. Forrester): anemia in preg/childhood, school feeding, supplementation, deworming,

Final question: “What is the added value of under nutrition programming in the first 1000 days for chronic disease prevention?”

Discussion during Programming Small Group

Deitchler, Flores-Ayala, Guyon, Mbuya, Popkin, Sullivan, Tilahun

Questions:

- What gaps are there and is there something that we need to focus on?
- What should we be pushing as indicators?
- What research should we be promoting?
- What are the implications of our measurements and is there anything that needs to change when implementing nutrition programs under 5?

Discussion:

- BMI for children from 2-5 is in the DHS
- There’s a gap between childhood and adolescence and surveillance of adolescent nutrition is missing
 - Sprinkles for teens as well
 - We’ve focused on adolescent education, but not adolescent growth
- Should we move away from weight for age because it promotes obesity and ignores stunting?
 - FTF indicators have changed to be height for age, so the behavior change away from weight takes time
 - Rationale for the change of guidelines needs to be clear
 - Changing, at the feeding program level, would it be feasible to check their length?
- Growth velocity charts from WHO can’t measure growth less than two months and the preparation isn’t simple
- Put the lens to what are we doing now that doesn’t account for potential risk for NCDs like: avoid oil and sugar fortifications and find healthier vehicles that we want to promote, avoid macro fortification plans and look at specific countries, micronutrient powders help reach many deficiencies, so let’s explore these packages, food rations to pregnant women
- Too much measurement in a program can occasionally take away from the complex advice that the parents should receive
- We don’t know a lot about what nutrition is necessary for height, but we know for growth – there’s a complexity between nutrition messaging because weaning foods need to be separated from post-weaning foods (too much fat and oil)
- Can the DHS measure high blood pressure and diabetes to incorporate NCDs?

Discussion during plenary

- Useful to look at school supplementation/deworming—Micronutrients are key.
- There are opportunities for packaging adolescent-focused HIV, family planning, nutrition joint programming.
 - Have DHS data on 15-17 year old overweight.
 - Adolescents are never in health programs for nutrition, but for HIV and family planning.
 - USAID proposed an online course on adolescence and NCDs along with WHO.

Final Discussion

- CDC will promote investment in 1000 days as protective investment in the future.
- SPRING NCD group will continue to liaise with experts on subgroups, measurements of change, and how to look at categories of transition.
- World Bank is trying to adapt support for the new changes in southeast Asia. Would be helpful to understand what programmatic changes need to take place to improve programming in 1000 days. Looking at a lot of multisectoral approaches.
- The World Bank looks more globally, trying to supplement and integrate these programs. Also looking at cross-collaboration, to integrate learning and applications. Looking at a lot of sector work and behavior change for 1000 days and NCDs.

LIST OF ATTENDEES

Name	Organization
Agnes Guyon	SPRING/JSI
Amanda Pomeroy	SPRING/JSI
Anne Peniston	USAID
Anu Narayan	SPRING/HKI
Ariel Pablos-Mendez	USAID
Barry Popkin	UNC
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Jessica Tilahun	USAID
Kate Franko	State
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