Concluding Discussion

Dr. Haschke: To start the discussion, I want to summarize the highlights of the workshop. On the first day, we dealt with normal growth and reference data, and the first presentation was on ethnic differences. We learned that Asia is different, and there are secular trends everywhere. Asia is coming closer to Western patterns. Then we had a discussion on the normative references. We learned how the National Center for Health Statistics (NCHS) is moving to so-called US standards in the future. Dr. Frongillo told us about the differences in growth between breast-fed infants and the old NCHS references. The new Euro-Growth references as well as factors influencing growth such as genetics and nutrition were presented. Dr. Räihä showed us that with a low protein intake (1.8 g/100 kcal), formula-fed infants grow well during the first 4 months of life, so it is possible to lower the protein content of modern infant formulas, and this will probably have some impact in the future.

The second session was on epidemiology and the causes of growth failure. We learned that stunting is prevalent everywhere—32% in the year 2000 in developing countries—but there is a good chance that it will be less than 10% in Latin America. We looked at intrauterine growth. Intrauterine growth retardation is 24% and for term infants 11%. We discussed ways to prevent this through food fortification and the control of infection. Then the conventional thinking about how growth failure develops was challenged. Conventional thinking is that infants grow normally during the first 3–4 months, but it was shown during this meeting that stunting already starts in utero and immediately after birth and then deteriorates. We then looked at key nutritional factors that are related to growth failure, and we discussed protein, zinc, calcium, iodine, and vitamin A. Finally, when we looked at the very complex topic of interactions between infection and growth, we learned about silent infections, about diarrhea, which we know has an impact on growth, and also about newer infections such as HIV, which also have an impact on growth, and particularly on length, even in developed countries.

The third session was on the consequences and prevention of growth failure. It was impressive to see how low birthweight and intrauterine growth failure increase mortality and how low gestational age influences mortality and morbidity, but we also learned that the birthweight in relation to gestational age is very important. Then we had a presentation on the psychosocial consequences and long-term effects, which showed us how important it is to prevent growth failure. We learned about schoolchildren: The stunted schoolchild unfortunately has a high probability of being stunted as an adult, and we heard about the limitations of all the programs that have been instituted to encourage stunted children to grow to a normal adult height. When we were discussing diet, we learned about processed complementary food, and we reviewed in particular the situation here in Central and South America.

The fourth session was on nutrition transition, and Dr. Uauy gave us a very good picture of what has happened in Chile, in particular, the transition to animal fat and animal protein and its impact on growth. Something that he did not mention in his presentation but that I found in his manuscript, and that seems debatable and
interesting, is that in Central and South America, 20% of the population are in some way or other enrolled in nutritional programs, and that means 80 million people. I think we need to monitor the real outcome of these programs. Some seem to be very effective, as we have seen here in Chile, but as an overall goal in a continent, I think it is important to see how the money that is invested and all the work invested affect the outcome. It was certainly interesting to hear Dr. Uauy saying that nutrition and health can be priorities before the economy starts to grow, and Chile has shown that.

Finally, we had an interesting presentation on syndrome X, where we discussed programming, and it is not clear that it is only intrauterine programming that has an influence on the later increased risk of cardiovascular disease and diabetes. One of the last presentations at the workshop was Dr. Martorell’s presentation on obesity, and I would like him to start the final discussion.

**Dr. Martorell:** I would like to start with one reflection. If you combine the Indian subcontinent region and Sub-Saharan Africa, you have quite a large percentage of the world’s child malnutrition problem: something like 80% of the number of underweight children. These regions will be the main foci of malnutrition in this new century. Then we have another large part of the world that includes Latin America, where levels of underweight have declined markedly and exist only in subpopulations. Some countries like Mexico and Brazil present a mosaic; for example, the north of Mexico has very little child underweight whereas the south has a lot. Mexico, like other countries in Latin America and Asia, has the economic means to launch programs such as the Progresa program that we heard about from Dr. Rivera. I think that if Mexico and other countries can target well designed nutrition programs, they will be successful in quickly eliminating the pockets of child underweight that remain.

I would like to comment on Dr. Haschke’s point about nutrition programs and their effectiveness. Philip Musgrove from the World Bank published a paper in 1993 called “Feeding Latin America’s Children,” in which he showed that a lot of the money spent to subsidize or provide food for people at risk of malnutrition was wasted (1). Programs were designed without targeting and served many who did not have malnutrition. What we see in the Mexican program described by Dr. Rivera-Dommarco is a better use of government resources. I’m very hopeful that much can be achieved with better use of existing resources in Latin America, but what do we do about places like Sub-Saharan Africa? These societies are very resource-poor. Dr. Gibson told us about how difficult it would be to improve complementary feeding without animal products, which are expensive and out of reach of poor people. However, she discussed fortification at the level of food preparation as a possible intervention, but this has yet to be tried out on a large scale. The situation in India is more hopeful than in Sub-Saharan Africa because it has a better managed economy and there seems to be more political will. The trends, though slow, show improvement in levels of underweight in India but are rising in Sub-Saharan Africa.

So, I leave this meeting feeling positive about some parts of the world and doubtful about others. At the end of this meeting, we have been considering the nutrition transition and how to avoid going from one problem that remains unsolved in much of the world to a new set of problems. That’s a challenge for all of us.

**Dr. Guiralde:** How are the agencies going to tackle the problem of the increasing orphan population in South Sub-Saharan Africa?

**Dr. Martorell:** Dr. Bill Foege, Senior Adviser to the Gates Foundation, has made it clear that the Gates Foundation is interested in improving the plight of orphans in
Sub-Saharan Africa. The impact on AIDS in Sub-Saharan Africa has enormous consequences because many of the deaths occur in the economically productive segment of the population. One of the consequences of AIDS is the growing population of orphans, but there are many other economic and social repercussions. I’m glad to see the Gates Foundation become interested in AIDS orphans as well as in the prevention and treatment of AIDS, particularly in Africa.

Dr. Lejarraga: I want to reflect on obesity and the difficult road between malnutrition and obesity. One consideration is that the human body was designed for the Stone Age—for lots of running, perhaps after a deer or away from a lion, and to eat once every 2 days or so—and that’s not the pattern we see today. So, perhaps obesity is, to a certain extent, the price we are paying for our present way of life. That is not going to be reversed easily.

Second, I agree with many people here who say that obesity cannot be seen as the opposite of malnutrition. It’s much more complex than that. I agree with Dr. Frongillo that it is a behavioral disorder related to psychological situations, with strong genetic determinants. In my experience, people who run obesity clinics have a very high failure rate, and treatment is not going to be successful unless there is a multifactorial approach.

Third, we must be very cautious over the way we go about publicizing the need to improve obesity rates. In my country, there is a growing prevalence of eating disorders in adolescents. Any effective campaign for reducing obesity may have an unfavorable impact on eating disorders among adolescents.

Dr. Ulijaszek: I would like to comment on undernutrition in Africa. What I see in this conference, as in other conferences before this, is the polite marginalization of Africa. Africa is economically marginal, agriculturally marginal, and nutritionally marginal. We are in a world where there is an opening up of global trade, which is seen as the way out of economic deprivation, but we see Africa being left out of the global picture.

Dr. Baker: For me as a clinician, there has been a very strong take-home message: that is, that those of us who identify problems, who set reference standards or goals, and who then make recommendations will also be able to take care of the caretakers. There is no doubt that childhood malnutrition is greatly affected by the caretaker. We’ve identified women as being very important, and their health as being important, too. We’ve also identified that it is important to educate those women, and for them to believe what we’ve educated them to do, whether it be sanitary health practices or nutritional practices, and then to put those into place. If we are able to do that, we may well have an effect. There is one issue that we haven’t identified that I think is important: Men are also caretakers of children, not only in the developed world but also in the developing world. The impact that men have on child care is not just in the direct care that is offered to children, but in their ideas and the influence they have on women. So, I hope the part of my take-home message will be that as a clinician, I will be able not only to educate and nurture women but also to offer that same education and nurturing to men, recognizing that they may require a different sort of nurturing and a different sort of education.

Dr. Manz: I have a reflection on indicators of stunting. One main reason for the success of the programs to prevent iodine deficiency disorders was the use of new and more specific indicators of iodine insufficiency. Thirty years ago, goiter was diagnosed by palpating the thyroid gland. Today, we use ultrasonography to quantify
the volume of the gland and iodine concentration or iodine/creatinine ratio to characterize the iodine supply of a population. Following the debates here, I have the impression that the indicator “stunting” is one aspect of the whole problem. Neonatologists have used the indicator “small for dates” for more than 30 years, based on regional reference values. The concept of stunting using standard US reference data does not reflect this progress, nor the limitations for catchup given by secular trends. Why don’t we look for other global or more specific indicators of the main causes of malnutrition as well? Such new anthropometric, functional, biochemical, or genetic indicators might help isolate problems and to solve the highly complex issue of malnutrition step by step. A famous German physiologist once said: “The most prominent scientific error of the 20th century was the idea of the normal value.”

Dr. Martorell: I agree with you that there are limitations to stunting, underweight, and wasting as indicators of the very complex problem of child malnutrition, but I don’t believe this is the reason why we have made so little progress. Also, I don’t believe progress with iodine deficiency disorders is explained by better indicators. There has been progress because we have a very effective intervention for dealing with iodine deficiency disorders: iodized salt. If we could add something to salt that would cure stunting, I think we would have seen more success.

Dr. Salasar: I want to comment on two things. First, we need to relate our present indicators, be they NCHS weight for height or body mass index, to the actual percentage of fat because that would be a better biological marker of obesity. Identifying an increase in body fat will precede biological markers such as alterations in the cholesterol profile, which are already measured in other countries. The common denominator of obesity is the percentage of fat. Second, given the fact that improved nutrition within the populations of underdeveloped countries is leading very fast toward obesity, we need to evaluate the impact of our nutritional programs to determine whether we are increasing body fat rather than height and lean body mass.

Dr. Flores: To follow up the concern expressed about Africa, it is worth remembering that we know very little about the effectiveness of aid. For example, we don’t know the effect in terms of nutrition if you increase the income of the household by 6%, 10%, or 20%. We don’t know the return if you increase education in the family by 5%, 10%, or 20%. We don’t know many things about interventions. What we do know is that one intervention will not be successful. A package of interventions is required. My idea is that we have to provide big packages for the poorest families to give them a start, but coupled with evaluation, because otherwise we will spend another 20 years without knowing what the return of our investment is.

Dr. Ramakrishnan: This is one important point that needs reiterating. It is very nice for researchers and scientists to look at growth as the outcome, but we need to remember why we are interested in growth. It is the functional consequence that matters. Governments are much less likely to be convinced by learning that a child has grown another centimeter than they are by hearing that the children will be free of disease, will be more productive, and will lead healthier lives. We are looking at growth as a proxy for these functional outcomes.

Dr. Rivera-Dommarco: I would like to refer to interventions aimed at preventing obesity. Many of us are worried because the success rate seems so low. However, there are certain socioeconomic groups that have been successful at reducing their prevalence of obesity. In Mexico, for example, there is now much less obesity in typ-
ical high socioeconomic status families than there was 10 or 20 years ago, and I think the same is true of the USA. Maybe we could learn from what has happened to those socioeconomic groups and the behavioral changes and motivations that drove them to change their dietary habits or their physical activity.

Dr. Ojeda: With regard to interventions, I agree the package is important, but coordination between providers is also very important. It is often the case that aid programs are administered by quite different authorities, depending on the age of the recipients and the type of aid, and the lack of coordination that results makes it difficult to evaluate the success of the programs. It is also very important that politicians are constantly appraised of all the knowledge and experience acquired from the kind of research that has been presented here; in a sense, they are our real problem, and in some cases they constitute one of the most important factors in undernutrition and underdevelopment in our countries.

Dr. Bhan: We should consider the kind of messages that policymakers get from international agencies and the scientific community. It still seems to me that there are two steps in the process of tackling low birthweight and child malnutrition. First, we need increased intakes of what is already available, and second, we need incremental quality improvement. Most programs are not able to meet the first goal. As was pointed out, a small deficit or surplus of energy on a daily basis can have a large effect over, say, 2 years; 100 kcal less and you’ll be 1 kg down by the end of the year. We are concentrating too much on peripherals at present, with agencies dealing with micronutrient deficiencies, vitamin A deficiency, and so on, but missing the broad picture. Chile is a very good example. It’s a good time now to think about zinc, but think what they have achieved without a zinc supplementation program! It should be very clear that a lot is achievable, and factors such as zinc are the icing on the cake. I am very disappointed with what I have been seeing in the last couple of years in South Asia. There is chaos—a new fashion every month, some days it’s multiple micronutrients, then it’s something else. We must develop the capacity to monitor what we do and examine our failures because the multiple interventions that are necessary to achieve our goals will not come by any other process.

Dr. Pelletier: I’d like to reinforce both of the last two comments. One of the encouraging things for me during the last 3 days has been what seems to be universal agreement that we are not going to find a solution in any one factor, whether that be a single micronutrient or even multiple micronutrients. It seems we’ve reaffirmed—if we can borrow from UNICEF—the food, health, and care trilogy, and all three must be there in the proper form in order to have good nutrition. The important corollary is that food, health, and care can and do vary from country to country, community to community, and even household to household. So, there are all these contextual factors—economic, ecological, cultural, political—that provide both barriers to and opportunities for moving forward. That brings us to the recognition that national capacity is critical. Some of the best success stories that we can point to in recent decades have been Thailand, Indonesia, Costa Rica, and Chile. What do they all have in common? It’s my impression that they all had strong in-built capacity to achieve change: This may have been facilitated by external agencies, but to a large extent, these countries were able to achieve large-scale improvement on their own, with their own systems. In the particular case of Chile, the role that the health professionals played is very interesting: It was both a technical role and a political role, from what I can tell. Although I would not want to generalize, I would say that a lot
of the countries that are still struggling or have very slow rates of improvement perhaps don’t yet have that capacity or maybe the right ingredients are not coupled together yet.

**Dr. Stoltzfus:** I have been pondering Dr. Martorell’s initial question: What do we do about Sub-Saharan Africa? It occurs to me that we are asking the wrong people, because the Africans aren’t here. I think, especially after what Dr. Bhan said, that the people who are going to solve that problem are the Sub-Saharan Africans themselves, and if we want to be part of that, then we need to engage them in the discussion and to build those collaborative relations.

**Dr. Haschke:** Being involved in programs on that continent, admittedly mainly in South Africa, I would like to point out that the issue in the Sub-Saharan zone is not related to nutrition and socioeconomic factors only: Management and prevention of the disease are poorly handled. In the Sub-Saharan zone, 2 million infants a year are born infected by HIV! This is a situation that has never existed anywhere else in the world before, and now it has to be tackled by some of the poorest countries. First of all, we have to find a way to let these children survive. If governments are not ready to pay $5 to prevent perinatal transmission of AIDS—that’s just one treatment for the mother and one for the baby that reduces perinatal transmission by 50%—it is hardly relevant that their nutrition programs are failing. There is no understanding in many of these countries that these children should not be infected, and if they survive, they should be well nourished. So, the problem is much more fundamental, and it cannot be related only to nutrition; nutrition is a small part of the whole issue.

**Dr. Räihä:** There has been a lot of discussion on obesity and nutrient intake, but nobody has taken up the question of basic differences in metabolic rate, perhaps genetic differences, and also the question of differences in intestinal absorption of nutrients. We know that many people can eat a lot and never get fat, and others eat almost nothing and get fat very easily.

**Dr. El-Khayat:** Obesity in Egypt is increasing rapidly. The reasons are multifactorial. Regarding physical activity, our society has changed from being an agricultural society in the 1950s to a business society, whereas with respect to genetics, consanguinity among Egyptians ranges between 30% and 50% as a result of first-cousin marriages. However, our diet is composed of 80% carbohydrate, mainly bread. I believe that recommendations to change the composition of the diet need to be specific to the country concerned. Dr. Räihä recommended reducing the protein content of formula milk from 2.2% to 1.8%, but I do not think this would be appropriate for Egypt, where protein intake is low. The composition of formula milk and the timing of introduction of solids need to be chosen according to the national situation.

**REFERENCE**