OMB No. 0925-0001 and 0925-0002 (Rev. 10/2021 Approved Through 09/30/2024)

BIOGRAPHICAL SKETCH

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NAME: Martorell, Reynaldo

eRA COMMONS USER NAME (credential, e.g., agency login): ): REYNALDO\_MARTORELL

POSITION TITLE: Robert Woodruff Professor of International Nutrition, Hubert Department of Global Health

EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)

| INSTITUTION AND LOCATION | DEGREE  (if applicable) | Completion Date  MM/YYYY | FIELD OF STUDY |
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| St. Louis University, St. Louis, MO | AB | 05/69 | Anthropology |
| University of Washington, Seattle, WA | PhD | 05/73 | Biological Anthropology |

**A. Personal Statement**I bring 50 years of research experience with cohort studies. I began my career at the Division of Human Development of the Institute of Nutrition of Central America and Panama where for 5 years I was a member of the team that carried out the INCAP Longitudinal Study (1972-77). Later, at Stanford, Cornell, and then Emory, I led the follow-up studies carried out from 1988 until 2005 and have continued as co-investigator since. These efforts have resulted in many contributions to knowledge about the short and long-term consequences of nutrition in early life, findings that have had great influence worldwide on policies and programs, providing some of the critical evidence for the present focus on the first 1000 days of life. I am a founding member of the COHORTS collaboration that brings together cohorts from Guatemala, Brazil, The Philippines, India, and South Africa. In Thailand, I was involved in the follow-up of a micronutrient intervention during infancy on cognitive development in school-age children; other relevant research includes assessing the long-term consequences of exposure to the Chinese famine of 1959-61 that was caused by Mao’s failed Great Leap Forward policies*.* I am also a co-investigator in birth cohort studies in Vietnam and Mexico.These experiences have given me the skills to formulate innovative research questions, conduct high-quality field studies, the methods to carry out rigorous analyses, and a commitment to identify the relevance of the findings for programs and policies.

**B. Positions, Scientific Appointments, and Honors  
Professional Positions:** *Scientist*, Institute of Nutrition of Central America and Panama (INCAP) (1972-77), PAHO/WHO, Guatemala; *Associate Professor,* Food Research Institute, Stanford University (1977-87); *Visiting Associate Professor*, Division of Nutritional Sciences, Cornell University (1983-84); *Professor of Nutrition,* Food Research Institute, Stanford University (1987-91); *Leading Professor*, Division of Nutritional Sciences, Cornell University (1991-93); *Chair,* Hubert Department of Global Health, The Rollins School of Public Health of Emory University (1997-2009). *Robert W. Woodruff Professor of International Nutrition,* Hubert Department of Global Health, The Rollins School of Public Health of Emory University (1993-Present); *Senior Advisor*, Global Health Institute, Emory University (2009-Present), Visiting Professor, University of Granada, Spain (2014).

**Current National and International Committees and Appointments:** Chair, External Advisory Committee, INCAP; Editorial Boards: Salud Pública de México, Food and Nutrition Bulletin, Archivos Latinoamericanos de Nutrición; Board Member, Executive Management Team, Food Fortification Initiative (2010- ); Trustee, Helen Keller International (2011- ).

**Honors:** McCollum International Lectureship Award, American Society For Nutrition (1999); The Fifth Distinguished Faculty Lecture, Emory University (2000); US National Academy of Medicine (elected 2002); Thomas Sellers Award (for mentoring), Rollins School of Public Health, Emory University (2003); Lifetime Achievements in Global Nutrition Research Award, American Society For Nutrition (2003); Fulbright Senior Scholar, Mahidol University, Thailand (2005); Research Achievement Award, Institute of Nutrition of Central America and Panama (2006); Marion V. Creekmore Award for Internationalization, Emory University (2008); Recognition Award, Centro de Investigación en Nutrición y Salud, National Institute of Public Health, Mexico (2010); Carlos Slim Award for Lifetime Achievements in Research on Health (2011); Achievement Award from the President of Honduras (2012); Gopalan Oration and Gold Medal Award, Nutrition Society of India (2012); Fellow of the American Society For Nutrition (elected 2013); Academia Española de Nutrición (elected 2013); Raymond Pearl Memorial Lecture, Human Biology Association (2016).

**C. Contributions to Science  
Policies and programs to improve maternal and child nutrition in poor countries:** Martorell has devoted his career to advance research, policies and programs regarding maternal and child nutrition. His achievements were recognized by The Lancet, which published a profile entitled “Reynaldo Martorell: driving force in maternal and child nutrition” (August 3, 2013). He is a coauthor of the 2008 and 2013 Lancet series on maternal and child nutrition that estimated the prevalence and short and long-term consequences of the major nutritional problems affecting low and middle-income countries; both series also presented recommendations for policies, programs and key interventions to address these problems. He led a team that recently completed a large-scale landscape analysis of maternal nutrition for the Bill and Melinda Gates Foundation that included systematic reviews of the scientific evidence on efficacy and effectiveness of nutrition interventions prior to conception and during pregnancy as well as field work in Nigeria, Ethiopia and India to assess program implementation barriers and opportunities. He led the Emory team that provided technical support in nutrition to CARE and the government of Bihar, India in an ambitious project that sought to improve the coverage and quality of services to mothers and children during the first 1000 days; innovations developed in 8 districts are being scaled up to the entire state (over 100 million people).

1. Victora CG, Adair L, Fall C, Hallal PC, **Martorell R**, Richter L, Sachdev HS, for the Maternal and Child Undernutrition Study Group. Maternal and child undernutrition 2: Consequences for adult health and human capital. *Lancet* 371(9609):340-57, 2008 January 26. (PMID: 18206223)
2. Black E. R, Victoria C, Walker S, Bhutta Z, Christian P, De Onis M, Ezzati M, Grantham-McGregor S, Katz J, **Martorell R**, Uauy R, and the Maternal and Child Nutrition Study Group. Maternal and Child Undernutrition and Overweight in Low-income and Middle-income Countries. *The Lancet* 382(9890):427-451, 2013 August. (PMID: 23746772)
3. Imhoff-Kunsch B, **Martorell R** (eds) Special Issue. Improving Maternal, Newborn, and Child Health Outcomes through Better Designed Policies and Programs that Enhance the Nutrition of Women. *Paediatr Perinat Epidemiol* 26(S1):1-325, 2012 July. (20 articles)
4. Mason JB, Saldanha LS, **Martorell R** (eds). Opportunities to improve women’s nutrition and maternal, neonatal and child health outcomes. *Food Nutr Bull* 33(S2):3-104, 2012. (7 articles).

**The importance of nutrition during the first 1000 days (pregnancy and the first 2 years of life).** Martorell’s work has been critical for advancing the notion that the first 1000 days (pregnancy and the first 2 years) represent a vulnerable phase during which poor health and nutrition have profound short and long-term effects. He led the many follow up studies of a community randomized intervention study in Guatemala that was carried out from 1969-77, except for the current follow-up which is led by his colleague Aryeh Stein. These follow-up studies have demonstrated that the nutrition intervention improved adult human capital measures such as schooling, intelligence and wages. Work on this theme has also extended to studies of the long-term consequences of the 1959-61 famine in China, the largest in human history, which may have killed 30 to 60 million people.

1. Hoddinott J, Maluccio JA, Behrman JR, Flores R, **Martorell R**. Effect of a nutrition intervention during early childhood on economic productivity in Guatemalan adults. *Lancet* 371(9610):411-6, 2008 February. (PMCID: PMC18242415)
2. Huang C, Li Z, Wang M, **Martorell R**. Early life exposure to the 1959-1961 Chinese famine has long-term health consequences. *J Nutr* 140(10):1874-8, 2010 October. (PMID: 20702751)
3. Huang C, Phillips MR, Zhang Y, Zhang J, Shi Q, Song Z, Ding Z, Pang S, **Martorell R.** Malnutrition in early life and adult mental health: evidence from a natural experiment. *Soc Sci Med* 2012 December. (PMCID:PMC3726543)
4. **Martorell R**. Improved nutrition in the first 1000 days and adult human capital and health. *American J Hum Biol* 29(2):e22952, 2017 March. (PMID: 28117514)

**Patterns and long-term consequences of growth failure in early childhood.** Martorell has been a student of human growth in the context of poverty, poor diets and disease for over 40 years. His many publications have described patterns of child growth as well as the short and long-term consequences of growth failure in early life. These findings have underscored the importance of improving the health and nutrition of young children.

1. Young MF, **Martorell R.** The public health challenge of early growth failure in India. *Eur J Clin Nutr* 67:496-500, 2013 February. (PMID: 23388670)
2. Adair LS, Fall CH, Osmond C, Stein AD, **Martorell R**, Ramirez-Zea M, Sachdev HS, Dahly DL, Bas I, Norris S, Micklesfield L, Hallal P, Victora C. Associations of linear growth and relative weight gain during early life with adult health and human capital in countries of low and middle income: findings from five birth cohort studies. *The Lancet* 382(9891):525-34, 2013 August. (PMID: PMC3744751)
3. **Martorell R.** Physical growth and development of the malnourished child: Contributions from 50 years of research at INCAP 1949-1999. *Food Nutr Bull* 31(1):68-82, 2010 March. (PMID: 20461905)
4. Hoddinott J, Behrman JR, Maluccio JA, Melgar P, Quisumbing AR, Ramirez-Zea M, Stein AD, Yount KM, **Martorell R**. Adult consequences of growth failure in early childhood. *Am J Clin Nutr* 98:1170-8, 2013 November. (PMCID:PMC3798075)

**Human growth: methods and standards.** Martorell and colleagues published a paper in the Lancet in 1974 that advanced the hypothesis that growth potential in length in children is similar around the world. Later, Martorell was part of the Executive Committee that designed and carried out the WHO Multicountry Growth Reference study that led to the 2006 child growth standards; this study showed that children growing in healthy environments in Brazil, the US, Ghana, Oman, Norway and India grew similarly from birth to 5 years of age. These child growth standards are used throughout the world. Martorell was one of the authors of the landmark effort to standardize methods for anthropometric assessments; this reference manual is the most used reference manual in anthropometry (13,596 citations reported by Google Scholar for the English edition). He also was a co-author of the influential UN publication on appropriate uses of anthropometry.

1. Habicht J P, **Martorell R**, Yarbrough C, Malina RM, Klein RE. Height and weight standards for preschool children: How relevant are ethnic differences in growth potential? *Lancet* 1:611 5, 1974.
2. Lohman TG, Roche AF and **Martorell R** (eds). *Anthropometric Standardization Reference Manual.* Human Kinetics Publishers, Inc., 1988, 177 pages. [An abridged 1991 edition was also published]
3. de Onis M, Garza C, Onyango AW, **Martorell R** (editors). WHO child growth standards. *Acta Paediatrica* 95(450S): 1-101, 2006. (PMID: 3314468)
4. Conkle J, Suchdev PS, Alexander E, Flores-Ayala R, Ramakrishnan U, **Martorell R**. Accuracy and reliability of a low-cost, handled 3D imaging system for child anthropometry. *PLos ONE* 13(10):e0205320, 2018 October. (PMCID: [PMC6200231](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6200231/))

**Micronutrient malnutrition: consequences and programs**. Martorell has been involved in a large number of studies that have looked at the functional consequences (such as morbidity, mortality, cognition) as well as programs to address these deficiencies. The widely cited monograph with Beaton documented that vitamin A capsules reduced mortality by 23% and this led to large investments and scale up of vitamin A supplementation programs in developing countries.

1. Beaton GH, **Martorell R**, Aronson KJ, Edmonston B, McCabe B, Rossand AC and Harvey B. *Effectiveness of Vitamin A Supplementation in the Control of Young Child Morbidity and Mortality in Developing Countries*. ACC/SCN State-of-the-Art Series Nutrition Policy Discussion Paper No. 13*.* Toronto, Canada:Toronto University, 1993.
2. **Martorell R**, Ascencio M, Tacsan L, Alfaro T, Young MF, Addo OY, Dary O, Flores-Ayala R. Effectiveness evaluation of the food fortification program of Costa Rica: impact on anemia prevalence and hemoglobin concentrations in women and children. *Am J Clin Nutr* 101(1):210-7, 2015 January. (PMID: 25527765)
3. Wendt AS, Stephenson R, Young MF, Verma P, Srikantiah S, Webb-Girard A, Hogue CJ, Ramakrishnan U, **Martorell R.** Identifying bottlenecks in the iron and folic acid supply chain in Bihar, India: a mixed-methods study. *BMC Health Services Research* 18:281, 2018 April (PMCID: [PMC5898001](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5898001/))
4. Ramírez-Luzuriaga MJ, Larson LM, Mannar V, Martorell R. Impact of double-fortified salt with iron and iodine on hemoglobin, anemia, and iron deficiency anemia: A systematic review and meta-analysis. *Adv in Nutr* 9(3):207-218, 2018 May. (PMID: 29767699)

List of Published Work in PubMed and Google Scholar (H index 111; Citations: >93 K)

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