

FOREWORD

Growth charts are an essential component of the paediatric toolkit. Their value resides in helping to determine the degree to which physiological needs for growth and development are being met during the important childhood period. However, their usefulness goes far beyond assessing children's nutritional status. Many governmental and United Nations agencies rely on growth charts for measuring the general well-being of populations, formulating health and related policies, and planning interventions and monitoring their effectiveness.

The origin of the WHO Child Growth Standards dates back to the early 1990s and the appointment of a group of experts to conduct a meticulous evaluation of the National Center for Health Statistics/World Health Organization (NCHS/WHO) growth reference, which had been recommended for international use since the late 1970s. This initial phase documented the deficiencies of the reference and led to a plan for developing new growth charts that would document how children *should* grow in all countries rather than merely describing *how* they grew at a particular time and place. The experts underscored the importance of ensuring that the new growth charts were consistent with “best” health practices.

A logical outcome of this plan was the WHO Multicentre Growth Reference Study (MGRS), which was implemented between 1997 and 2003 and serves as a model of collaboration for conducting international research. The MGRS is unique in that it was purposely designed to produce a standard rather than a reference. Although standards and references both serve as a basis for comparison, each enables a different interpretation. Since a standard defines how children should grow, deviations from the pattern it describes are evidence of abnormal growth. A reference, on the other hand, does not provide as sound a basis for such value judgements, although in practice references often are mistakenly used as standards.

The MGRS data provide a solid foundation for developing a standard because they are based on healthy children living under conditions likely to favour achievement of their full genetic growth potential. Furthermore, the mothers of the children selected for the construction of the standards engaged in fundamental health-promoting practices, namely breastfeeding and not smoking.

A second feature of the study that makes it attractive as a standard for application everywhere is that it included children from a diverse set of countries: Brazil, Ghana, India, Norway, Oman and the USA. By selecting privileged, healthy populations the study reduced the impact of environmental variation. Nevertheless, the sample had considerable built-in ethnic or genetic variability in addition to cultural variation in how children are nurtured, which further strengthens the standard's universal applicability.

A key characteristic of the new standards is that they explicitly identify breastfeeding as the biological norm and establish the breastfed child as the normative model for growth and development. Another distinguishing feature of the new standards is that they include windows of achievement for six gross motor development milestones. In the past, although WHO issued recommendations concerning attained physical growth, it had not previously made recommendations for assessing motor development.

This supplement, which presents the first set of the new WHO Child Growth Standards and related data, is divided into five sections. The first three papers provide an overview of the MGRS sample statistics and baseline characteristics, document compliance with the study's feeding criteria, and describe the sample's breastfeeding and complementary feeding practices. The following two papers describe the methods used to standardize the assessment of anthropometric measurements and motor development assessments, and present estimates of the assessments' reliability. The sixth and seventh papers examine differences in linear growth and motor milestone achievement among populations and between sexes, and evaluate the appropriateness of pooling data for the purpose of constructing a single international standard. Next is an overview of the methods used to construct the growth standards based on length/height, weight and age, followed by the windows of achievement for the six gross motor development milestones, and the resulting growth curves and actual windows of achievement. The tenth and final paper examines the relationship between physical growth indicators and ages of achievement of gross motor milestones in the sample population used to construct the standards.

The WHO Child Growth Standards provide a technically robust tool for assessing the well-being of infants and young children. By replacing the NCHS/WHO growth reference, which is based on children from a single country, with one based on an international group of children, we recognize that children the world over grow similarly when their health and care needs are met. In the same way, by linking physical growth to motor development, we underscore the crucial point that although normal physical growth is a necessary enabler of human development,

it is insufficient on its own. Together, three new elements—a *prescriptive* approach that moves beyond the development of growth references towards a standard, inclusion of children from around the world, and links to motor development—provide a solid instrument for helping to meet the health and nutritional needs of all the world’s children.

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