Hong Kong Growth Chart 2020 Data Tables - User Guide

Data Tables

There are two publicly available versions of Hong Kong Growth Chart 2020 (HKGS-2020).

The '**Standard Table**' contains simplified information that is more useful in practical settings. It contains monthly LMS and centile values from birth to 5 years, then half-yearly values from 5.5 to 18 years. Data for each growth parameter (length/height in cm, weight in kg, BMI in kg/m^2, head circumference (HC) in cm) are tabulated and formatted in their own worksheet with boys' and girls' values tabulated side-by-side.

The '**Research Table**' contains detailed information that might be required for research use. LMS and centile values are reported by age in days from birth to 18 years. The data is in long format where all growth parameters and sex are stacked and indicated by separate columns, which should be easier to manipulate in statistical software.

Data Dictionary – Standard Table

Column name	Description
Age months	Age in months
Age years	Age in years (rounded to 1 decimal place)
mu	M value from the LMS model
sigma	S value from the LMS model
nu	L value from the LMS model
cent	0.4th, 2nd, 9th, 25th, 75th, 91st, 98th, 99.6th centile values (rounded to closest 2 decimal places)

Data Dictionary – Research Table

| Column name	Description

var	Growth parameters:
	    hgt length/height
	    wgt weight
	    bmi BMI
	    hc head circumference

age.d	Age in days (exact)
age.m	Age in months (rounded to integer)
age	Age in years (rounded to 1 decimal place)

sex	Sex:
	    F Female
	    M Male

mu	M value from the LMS model
sigma	S value from the LMS model
nu	L value from the LMS model
cent	0.4th, 2nd, 9th, 25th, 75th, 91st, 98th, 99.6th centile values

Technical Notes

The data for length/height and head circumference were produced based on an LMS model using growth data collected between 2020 and 2022.

The data for BMI is a smoothed harmonisation of the LMS parameters constructed using observed BMI in 2020-2022 with those from the HK-1993 BMI chart. The smoothed harmonisation was done using a weighted mean with weights derived from the following logistic function:

$$w = \frac{1}{1 + e^{-(age-2)}}$$

where "age" is age in years. The actual smoothing weights from age 0 to 8 years are shown in the figure below.
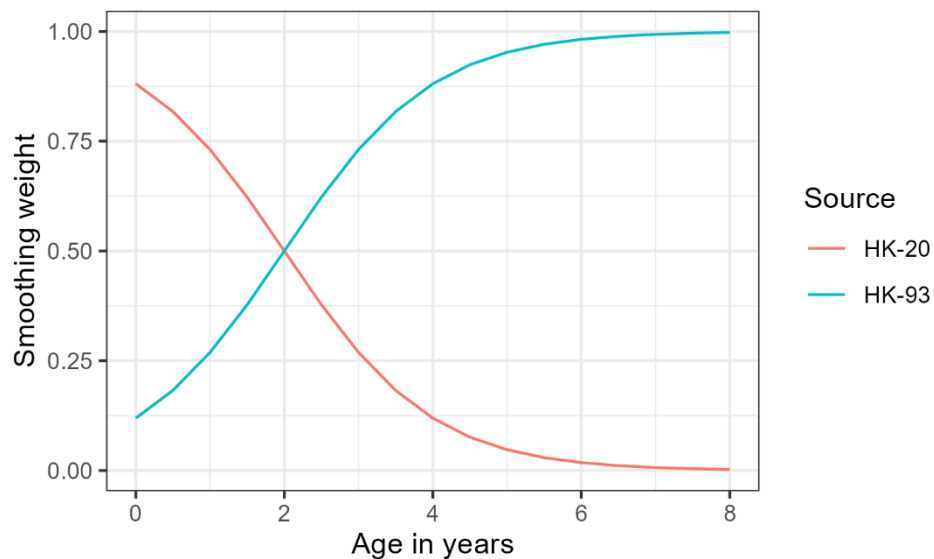
This approach was used because HK-1993 is the preferred chart to avoid normalising childhood obesity, given the secular increasing trend in BMI. However, the HK-1993 does not provide sufficient fit for children age under 2 years, where screening for obesity is less of a concern but the identification of underweight and failure to thrive is of greater importance. To avoid discontinuity in the BMI chart, a harmonisation approach was adopted. The influence of the contemporary secular trend in BMI is nullified at age of 8, as shown in the above chart.

A similar approach was used for the weight-for-age chart by harmonising a chart from counterfactual weight capturing the secular trend in height but not in BMI, and a chart purely based on the observed weight in 2020-2022. The technical details are being described in a manuscript under preparation.