

Growth chart

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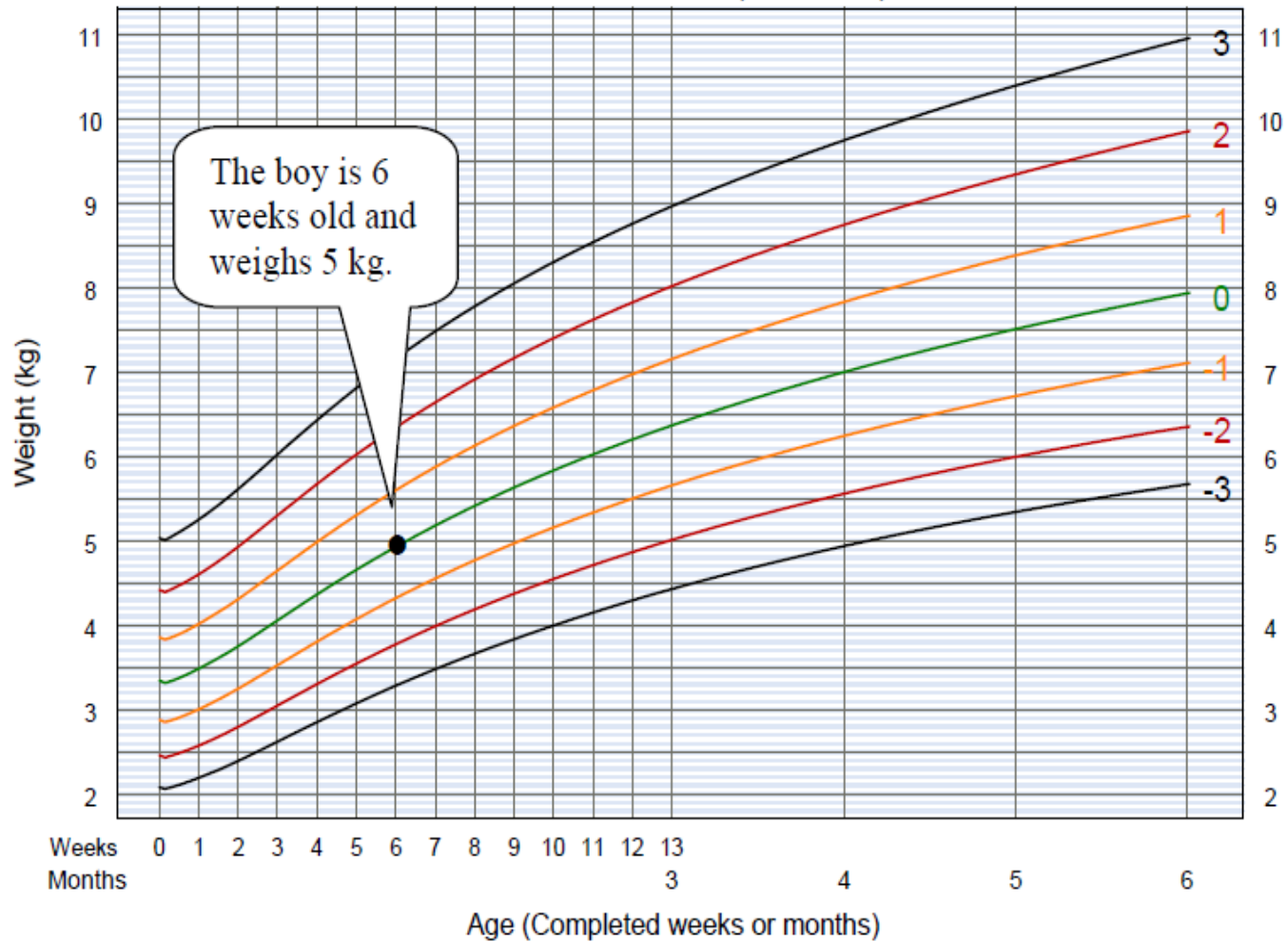
- **The WHO child growth standards**
- The World Health Organization (WHO) has developed growth standards based on a sample of children from six countries: Brazil, Ghana, India, Norway, Oman, and the United States of America.
- The WHO Multicentre Growth Reference Study (MGRS)¹ was designed to provide
- growth standards for birth to 5 years of age.
- By including children from many countries who were receiving recommended feeding and care, the MGRS resulted in prescriptive **standards for normal growth, as opposed to simply** descriptive references.

- standards can be used anywhere in the world, since the study also showed that children everywhere grow in similar patterns when their nutrition, health, and care needs are met.
- The new standards will help better identify stunted and overweight/obese children.
- New standards such as BMI (body mass index) are useful for measuring the increasing worldwide epidemic of obesity.

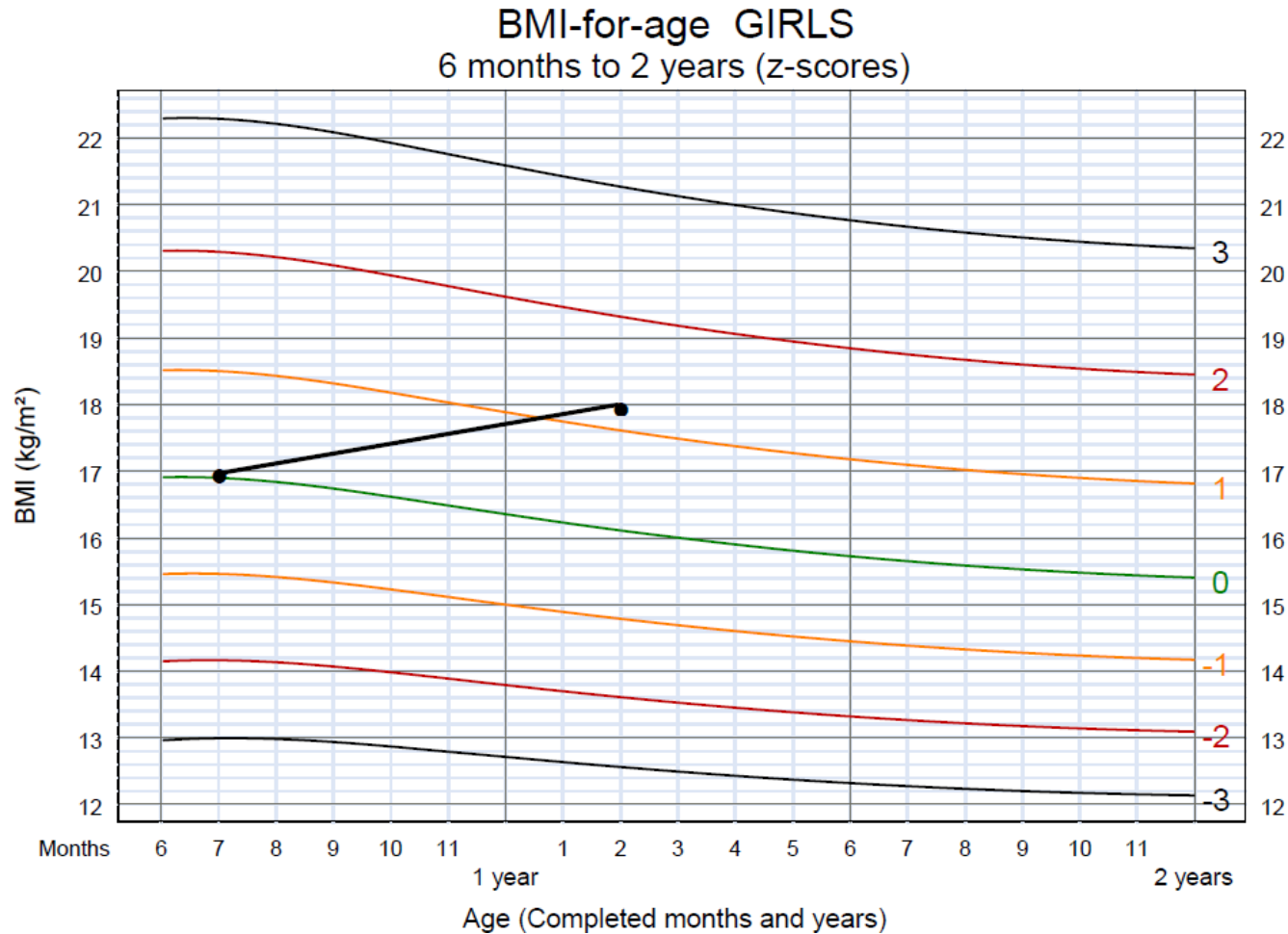
- Growth indicators are used to assess growth considering a child's age and measurements together.
- length/height-for-age
- weight-for-age
- weight-for-length/height
- BMI (body mass index)-for-age
- The specific charts used will depend on the child's age, which determines whether the child will stand for measurement of height or lie down for measurement of length.

- On the graph below, age (in weeks or months) is on the x axis; weight in kilograms is on the y axis.
- The horizontal lines represent 0.1 kg (100 g) increments. A point has been plotted for an infant boy who is 6 weeks old and weighs 5 kg.
- The curved lines on the graph are reference lines that will help you interpret the plotted points and trends.

Weight-for-age BOYS Birth to 6 months (z-scores)



The following chart shows a girl's BMI-for-age at two visits. The horizontal lines represent 0.2 BMI units. At the first visit, she has completed 7 months since birth and has a BMI of 17.



- Read points as follows:
- A point between the z-score lines **-2 and -3 is “below-2.”**
- A point between the z-score lines 2 and 3 is “above 2.”
- If it is plotted exactly on the z-score line, it is considered in the less severe category. For example, weight-for age on the -3 line is considered “underweight” as opposed to “severely underweight.”

Growth Problems

Compare the points plotted on the child's growth charts with the z-score lines to determine whether they indicate a growth problem. Measurements in the shaded boxes are in the Normal range

Z-score	Growth indicators			
	Length/height-for-age	Weight-for-age	Weight-for-length/height	BMI-for-age
Above 3	<i>See note 1</i>	<i>See note 2</i>	<i>Obese</i>	<i>Obese</i>
Above 2			<i>Overweight</i>	<i>Overweight</i>
Above 1			<i>Possible risk of overweight (See note 3)</i>	<i>Possible risk of overweight (See note 3)</i>
0 (median)				
Below -1				
Below -2	<i>Stunted (See note 4)</i>	<i>Underweight</i>	<i>Wasted</i>	<i>Wasted</i>
Below -3	<i>Severely stunted (See note 4)</i>	<i>Severely underweight (See note 5)</i>	<i>Severely wasted</i>	<i>Severely wasted</i>

- *1. A child in this range is very tall. Tallness is rarely a problem, unless it is so excessive that it may indicate an endocrine disorder such as a growth-hormone-producing tumor. Refer a child in this range for assessment if you suspect an endocrine disorder (e.g. if parents of normal height have a child who is excessively tall for his or her age).*
- *2. A child whose weight-for-age falls in this range may have a growth problem, but this is better assessed from weight-for-length/height or BMI-for-age.*
- *3. A plotted point above 1 shows possible risk. A trend towards the 2 z-score line shows definite risk.*
- *4. It is possible for a stunted or severely stunted child to become overweight.*
- *5. This is referred to as very low weight in IMCI training modules*

Interpret trends on growth chart

- “Normally” growing children follow trends that are, in general, parallel to the median and z-score lines. Most children will grow in a “track,” that is, on or between z-score lines and roughly parallel to the median; the track may be below or above the median.
- When interpreting growth charts, be alert for the following situations, which may indicate a problem or suggest risk:
 - A child’s growth line crosses a z-score line.
 - There is a sharp incline or decline in the child’s growth line.
 - The child’s growth line remains flat (stagnant); i.e. there is no gain in weight or length/height.

Crossing

- Growth lines that cross z-score lines (not just those that are labelled on the chart) indicate possible risk.
- Children who are growing and developing normally will generally be on or between -2 and 2 z-scores of a given indicator..
- The figure below presents two theoretical growth lines. In one of the lines growth generally tracks along 2 z-score crossing it from time to time in a pattern that indicates no risk.
- The other line shows a boy's weight falling away from his expected growth track. Although his growth line remains between -1 and -2 z-score, this child has in fact crossed z-scores following a systematic trend that indicates a risk

Weight-for-age BOYS 6 months to 2 years (z-scores)

