ANZSPED
AUSTRALIA AND NEW ZEALAND SOCIETY FOR PAEDIATRIC ENDOCRINOLOGY AND DIABETES

Height/Length and BMI Z-Score Calculators

ANZSPED provides Height/Length and BMI Z-Score (Standard Deviation Score; SDS) calculators in the form of Excel files that can be downloaded and used by clinicians. These resources were developed by Dr Ian Hughes (Child and Adolescent Growth Subcommittee) to facilitate Z-score calculation for large numbers of patients, such as for research studies, with high fidelity. Online calculators are available but are inefficient for the calculation of large numbers of Z-scores and subject to transcribing errors. The ANZSPED Excel files allow for large amounts of data to be copied and pasted, providing instantaneous and accurate Z-score calculations.

Height Z-scores are calculated based on Centers for Disease Control (CDC) 2000 and World Health Organization (WHO) standards. BMI Z-scores are calculated based on CDC-2000, WHO, and International Obesity Task Force (IOTF) standards. Links to the original CDC-2000 and WHO standards and the formulas used to perform the calculations are provided below. IOTF tables and a reference paper are available on the Clinical Resources / Growth & Growth Charts / Growth Calculators page of the ANZSPED website. Recently, the CDC has released a new method for calculating BMI Z-scores above the 95th percentile (Extended CDC BMI-for-age growth charts), see link below. Currently, the ANZSPED Excel CDC-BMI calculators does not incorporate the new methodology.

The ANZSPED Excel files are designed to be downloaded to the researcher's computer where they can be saved and used by the researcher. Specific instructions can be found on the "Instructions" tab of the Excel files on the far right. Data is pasted into the "Data Entry" tab below some data in brown that is provided as an example. The other tabs contain data that is "looked-up", and can be ignored by the user. Briefly, Age, Sex, and Height/BMI (depending on the file being used), data can be pasted from the researchers file into the "Data Entry" tab of the ANZSPED Excel file in the appropriate columns. ID can also be pasted. It is important that Age and Sex are entered correctly. Age must be entered in years, as accurately as possible. If the researcher has age saved in months, for example, it will need to be converted to years before pasting. For the Height SDS calculator, Sex has to be entered as Male or Female; for the BMI SDS calculator as 1 or 2. Again, some editing may be required before pasting.

Once Age, Sex, and Height/BMI data has been inserted, all of the other columns will automatically populate as values are looked-up and calculations performed. Only the CDC SDS, WHO SDS, IOTF SDS columns will be relevant as they contain the SDS (Z-score) values of interest. The other columns contain different versions of Age, and the L, M, and S values (see links below or Instructions tab for explanation) required for the calculations. They remain visible to help in any problem troubleshooting but can safely be ignored. The particular Z-score of interest, eg CDC, can then be copied and pasted (use the "paste values" option of paste) back into the researcher's Excel file (making sure not to include the example data!).

While every effort has been made to ensure the accuracy and fidelity of these calculators it is the responsibility of the Researcher to use them correctly and check the validity of their results, ANZSPED cannot be held responsible for any erroneous results or misinterpretations of results.

All the best in using the ANZSPED Height/Length and BMI Z-Score Calculators.

Ian Hughes

On behalf of the Child and Adolescent Growth (CAG) Subcommittee (August 2025)

Links

https://www.cdc.gov/growthcharts/cdc-data-files.htm

https://www.cdc.gov/growthcharts/who-data-files.htm

https://www.cdc.gov/growthcharts/extended-bmi-data-files.htm