# Summary of recommended data quality checks

The Working Group (WG) on Anthropometry Data Quality recommendation is that data quality be assessed and reported based on assessment on the following 7 parameters: (i) Completeness; (ii) Sex ratio; (iii) Age distribution; (iv) Digit preference of heights and weights; (v) Implausible z score values; (vi) Standard deviation of z scores; and (vii) Normality of z scores.

The WG recommends that (i) data quality checks should not be considered in isolation; (ii) formal tests or scoring should not be conducted; (iii) the checks should be used to help users identify issues with the data quality to improve interpretation of the malnutrition estimates from the survey. Although not exhaustive, a summary of details on the various checks is provided below to help their use. Full details and more comprehensive guidance, including on how to calculate, can be found at the full report on the WG’s recommendations[[1]](#footnote-1).

**(i) Completeness: although not all statistics are included in the WHO Anthro Survey Analyser, report on structural integrity of the aspects listed below should be included in the final report:**

* PSUs: % of selected PSUs that were visited.
* Households: % of selected households in the PSUs interviewed or recorded as not interviewed (specifying why).
* Household members: % of household rosters that were completed.
* Children: % of all eligible children are interviewed and measured, or recorded as not interviewed or measured (specifying why), with no duplicate cases.
* Dates of birth: % of dates of birth for all eligible children that were complete.

**(ii) Sex ratio:**

* What - ratio of girls to boys in the survey and compare to expected for country. The observed ratios should be compared to the expect patterns based on reliable sources.
* Why – to identify potential selection biases.

**(iii) Age distribution:**

* What – age distributions by age in completed years (6 bars weighted), months (72 bars) and calendar month of birth (12 bars), as histograms.
* Why – to identify potential selection biases or misreporting.

**(iv) Height and weight digit preference:**

* What –terminal digits as well as whole number integer distributions through histograms.
* Why – Digit preference may be a tell-tale sign of data fabrication or inadequate care and attention during data collection and recording. When possible, it should be presented by team or other relevant disaggregation categories.

**(v) Implausible z score values:**

* What – the % of cases outside of WHO flags[[2]](#footnote-2) for each HAZ, WHZ and WAZ.
* Why – a percent above 1% can be indicative of potential data quality issues in measurements or age determination It should be presented by team or other relevant disaggregation categories.

**(vi) Standard deviations:**

* What –SD for each HAZ, WHZ and WAZ.
* Why – large SDs may be a sign of data quality problems and/or population heterogeneity. It is unclear what causes SD’s size and more research is needed to determine appropriate interpretation. It should be noted that SDs are typically wider for HAZ than WHZ or WAZ, and that HAZ SD is typically widest in youngest (0-5 mo) and increases as children age through to 5 years. No substantial difference should be observed between boys and girls. It should be presented by team or other relevant disaggregation categories.

**(vii) Checks of normality:**

* What – measures of asymmetry (skew) and tailedness (kurtosis) of HAZ, WHZ and WAZ, as well as density plots.
* Why – general assumption that 3 indices are normally distributed but unclear if applicable to populations with varying patterns of malnutrition. One can use the rule of thumb ranges of <-0.5 or >+0.5 for skewness to indicate asymmetry and <2 or >4 for kurtosis to indicate heavy or light tails. Further research needed to understand patterns in different contexts. Anyhow the comparisons amongst the distribution by disaggregation categories might help with the interpretation of results.

1. Working Group on Anthropometric Data Quality, for the WHO-UNICEF Technical Expert Advisory Group on Nutrition Monitoring (TEAM). Recommendations for improving the quality of anthropometric data and its analysis and reporting. Available at [www.who.int/nutrition/team](https://www.who.int/nutrition/team) (under “Technical reports and papers”). [↑](#footnote-ref-1)
2. WHO Anthro Software for personal computers - Manual (2011). Available at [www.who.int/childgrowth/software/anthro\_pc\_manual\_v322.pdf?ua=1](https://www.who.int/childgrowth/software/anthro_pc_manual_v322.pdf?ua=1). [↑](#footnote-ref-2)