



Technical notes on compliance with the maternal height and weight measures (at time of conception) included in the Queensland Perinatal Data Collection (QPDC) from July 2007.

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Key findings

This report examines compliance with the requirement to report maternal height and weight on the QPDC data collection form (MR63D). These measures were introduced into the QPDC in July 2007 and are used to derive body mass index (BMI). This evaluation includes data from the 2007/2008 and 2008/2009 financial years. The key findings are as follows:

- The formula used to derive BMI from height and weight is correct.
- Compliance with the reporting requirement was an issue with the “Not stated” value (999) being used in 6% of cases for height and 4% of cases for weight. As a result, BMI could not be calculated in 7% of cases.
- Compliance improved with time, with reporting rates being better in 2008/2009 than in 2007/2008.
- Facilities in the private sector performed better than those in the public sector in terms of reporting height and weight.
- Reporting rates were evaluated for the five facilities with the poorest compliance rates overall. All five facilities showed substantial improvement between 2007/2008 and 2008/2009.
- The QPDC includes validation checks for height and weight. An additional check based on BMI has been recommended and this recommendation has been accepted.

Compliance with the new requirement to record height and weight of the mother at conception has shown improvement since the implementation of these measures in July 2007. However, it is important to monitor compliance at least in the short term to ensure that this improvement is maintained over time.

1.0 Background and purpose of the report

The Queensland Perinatal Data Collection (QPDC) was established to provide basic statistical information to assist with the planning of Queensland Health services and to serve as source of information to support research into obstetrics and neonatal care. Changes are introduced on a regular basis in response to evolving information requirements and planning needs. The changes are usually implemented on a financial year basis, although reporting QPDC data is often based on calendar year.

Several changes were introduced at the commencement of the 2007/2008 financial year. Two changes form the basis of this report – the inclusion of self-reported weight at the time of conception and self-reported or measured height. These are used to calculate body mass index (BMI), which is used to assist in identifying pregnancies potentially at risk. A full list of the changes made appears in Appendix A.

Recent experience with the QPDC suggests that data quality issues arise in the period immediately following the implementation of a new data item. The quality issues are usually resolved over a period of time as practitioners become more familiar with the collection requirements. This process is expedited when data integrity checks are made within the Health Statistics Centre.

The purpose of this report is to undertake data quality checks on the self reported weight and height measures. The evaluation is completed on roughly 18 months of data, and recommendations are made as to appropriate data validation strategies.

2.0 Methodology

The data were extracted from the Queensland Perinatal Data Collection (QPDC) on June 15, 2009 and included available data for the 2007/2008 and 2008/2009 financial years. The 2008/2009 data had not been finalised as at the extraction date with the most recent discharge date being May 3, 2009. There were 56,178 records for 2007/2008 and 26,074 for 2008/2009.

The three variables of interest were height, weight and body mass index. Body mass index was a derived variable that was generated automatically within the system using height and weight and the following formula:

$$\text{BMI} = \text{weight (kg)} / \text{height (m)}^2$$

The formula was verified by independently creating a variable and comparing it to values generated automatically. The correlation between the two was perfect at $r=1.00$.

3.0 Results

3.1 Compliance

The value '999' (Not stated) was reported for BMI in 7% of cases over the entire study period (Table 1). This was higher in 2007/2008 than in 2008/2009 (9% versus 4%), which suggests that compliance with the data collection requirement has improved over time. Compliance was slightly poorer for self-reported/measured height than for self-reported weight. The '999' value was used more frequently for both measures in public facilities than in private facilities (Table 2).

Table 1: Compliance with height and weight measures and the impact on the derived measure of Body Mass Index

Year	BMI = 999		Height = 999		Weight = 999	
	n	%	n	%	n	%
2007/2008	4,791	8.5	4,202	7.5	2,822	5.0
2008/2009	1,169	4.5	954	3.7	771	3.0
2007/2008 - 2008/2009	5,960	7.2	5,156	6.3	3,593	4.4

Table 2: Compliance with height and weight measures and the impact on the derived measure of Body Mass Index – comparison of Public and Private sector facilities

Sector	BMI = 999		Height = 999		Weight = 999	
	n	%	n	%	n	%
Public	5,308	9.4	4,638	8.2	3,123	5.5
Private	652	2.5	518	2.0	470	1.8

Table 3 shows data for the five facilities (of the 28 facilities with more than 1,000 births during the study period) that had the poorest record in supplying completed data during the 2007/2008 financial year. Townsville Hospital and Caboolture Hospital had the worst record during 2007/2008, with the '999' value occurring in more than one-quarter of women giving birth in each facility. However, based on available data, compliance has improved substantially in both facilities during the 2008/2009 financial year. In fact, compliance has improved with time in all five facilities listed in Table 3.

Any comparisons across financial years should be interpreted with caution, since data for the 2008/2009 financial year has not yet been finalised. Thus, the estimates for 2008/2009 are based on one-half as many cases as the estimates for 2007/2008.

Table 3: Facilities with the poorest record in relation to derived BMI (BMI='999') by financial year

Facility	2007/2008	2008/2009	2007/2008 - 2008/2009
Caboolture Hospital	31.3	12.6	24.4
Townsville Hospital	27.9	14.5	24.0
Redcliffe Hospital	15.8	13.1	14.9
Royal Brisbane and Women's Hospital	16.2	9.8	14.1
Mater Hospital Townsville*	16.7	5.9	11.8

* Based on facility identifier of 00410 in 2007/2008 and 00411 in 2008/2009

3.2 Data Integrity

The QPDC includes validation checks on measures included in the collection. Height and weight are no exception. For height, a fatal error is issued for null values or when height falls outside of the range 100-250 cm. A value of '999' is permitted and does not result in a fatal error. A warning is issued when height is between 100 and 130 cm or 190 and 250 cm. For weight, a fatal error is issued for null values and for values outside of the range 35 to 200 kg and a warning is issued for values for weights between 130 and 200 kg.

An inspection of height and weight indicated that all heights fell within permissible limits. The range was 102 to 212 cm or 999 (6.3%). Two out-of-range

values were identified for weight – one of 33 kg and one of 593 kg. The Data Collections Unit confirmed that these have been corrected in the production environment and their continued presence in the output environment (OE) table most likely reflects the lag in updating OE tables. This will be evaluated after the next refresh of the perinatal OE tables.

3.3 Proposed additional integrity check

In the Chief Health Officer's report (2008)¹, data was presented only for adults whose Body Mass Index was in the range 16-60. This range was evaluated as a possible further integrity check of height and weight in the QPDC data. When this check was applied, an additional 174 records were identified as needing review. In particular, there were at least two cases where the height/weight combination appeared questionable: in one, a height of 104 cm and a weight of 174 kg was recorded; in the second, the height was 110 cm and the weight 168 kg. The Data Collections Unit investigated these cases and later verified that the height and weight was correct in both cases.

The recommendation that BMI range (16-60) be implemented as an additional integrity check has been accepted on the grounds that it may identify errors that would otherwise be missed without substantially increasing workload. The BMI check will only be made on cases where height and/or weight have **not** already generated an error flag; height and/or weight values of '999' will not cause BMI to raise a flag.

4.0 Conclusions

Our experience with the inclusion of height and weight measures into the QPDC in July 2007 is consistent with earlier experiences following the inclusion of new measures. There was, initially, an issue with compliance, although this appears to be improving with time. Any analysis and/or routine reporting of maternal body mass index should note this, particularly for the period evaluated in this report. We would recommend that this evaluation be repeated at least yearly in the short term to establish that the improvements observed in 2008/2009 are sustained over time.

References:

1. Queensland Health. The Health of Queenslanders 2008: Prevention of Chronic Disease. Second Report of the Chief Health Officer Queensland, Queensland Health. Brisbane; 2008

APPENDIX A: 2007 PERINATAL DATA COLLECTION FORM CHANGES (MR63D)

Introduction of:

- Collection of mother's name
- Nuchal Translucency Ultrasound indicator yes/no
- Morphology Ultrasound indicator yes/no
- Assessment of Chorionicity Ultrasound scan indicator yes/no
- Non-Pharmacological analgesia during labour/delivery
- Water birth indicator (planned or unplanned)
- Fetal scalp pH indicator and result
- Cord pH indicator and result
- Parity
- Height
- Weight
- Fluid baby received at any time during the birth episode
- Fluid baby received in the 24hrs prior to discharge
- Bottle fed indicator yes/no
- Smoking cessation advice indicator in the first 20 weeks