

ROBSON CLASSIFICATION

Implementation Manual



ROBSON CLASSIFICATION

Implementation Manual



Robson Classification: Implementation Manual

ISBN 978-92-4-151319-7

© World Health Organization 2017

Some rights reserved. This work is available under the Creative Commons Attribution-NonCommercial-ShareAlike 3.0 IGO licence (CC BY-NC-SA 3.0 IGO; <https://creativecommons.org/licenses/by-nc-sa/3.0/igo>).

Under the terms of this licence, you may copy, redistribute and adapt the work for non-commercial purposes, provided the work is appropriately cited, as indicated below. In any use of this work, there should be no suggestion that WHO endorses any specific organization, products or services. The use of the WHO logo is not permitted. If you adapt the work, then you must license your work under the same or equivalent Creative Commons licence. If you create a translation of this work, you should add the following disclaimer along with the suggested citation: "This translation was not created by the World Health Organization (WHO). WHO is not responsible for the content or accuracy of this translation. The original English edition shall be the binding and authentic edition".

Any mediation relating to disputes arising under the licence shall be conducted in accordance with the mediation rules of the World Intellectual Property Organization.

Suggested citation. Robson Classification: Implementation Manual. Geneva: World Health Organization; 2017. Licence: [CC BY-NC-SA 3.0 IGO](https://creativecommons.org/licenses/by-nc-sa/3.0/igo).

Cataloguing-in-Publication (CIP) data. CIP data are available at <http://apps.who.int/iris>.

Sales, rights and licensing. To purchase WHO publications, see <http://apps.who.int/bookorders>. To submit requests for commercial use and queries on rights and licensing, see <http://www.who.int/about/licensing>.

Third-party materials. If you wish to reuse material from this work that is attributed to a third party, such as tables, figures or images, it is your responsibility to determine whether permission is needed for that reuse and to obtain permission from the copyright holder. The risk of claims resulting from infringement of any third-party-owned component in the work rests solely with the user.

General disclaimers. The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of WHO concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted and dashed lines on maps represent approximate border lines for which there may not yet be full agreement.

The mention of specific companies or of certain manufacturers' products does not imply that they are endorsed or recommended by WHO in preference to others of a similar nature that are not mentioned. Errors and omissions excepted, the names of proprietary products are distinguished by initial capital letters.

All reasonable precautions have been taken by WHO to verify the information contained in this publication. However, the published material is being distributed without warranty of any kind, either expressed or implied. The responsibility for the interpretation and use of the material lies with the reader. In no event shall WHO be liable for damages arising from its use.

| | | | | | |
|----|--|----|----|---|----|
| 01 | Introduction | 3 | 06 | The Robson Report Table | 32 |
| 02 | Purpose and target audience of this manual | 7 | 07 | How to interpret the Robson Classification data | 35 |
| 03 | The Robson Classification | 9 | 08 | Barriers and Facilitators to implement the Classification | 48 |
| 04 | Frequent questions on how to classify women | 21 | 09 | References | 50 |
| 05 | Ways of classifying women in the Robson groups | 28 | | | |

Example of Robson Report Table with Interpretation available at:
www.who.int/reproductivehealth/publications/maternal_perinatal_health/robson-classification/en/

01. Introduction

“RISING CS RATES ARE A MAJOR PUBLIC **HEALTH** CONCERN”

Over the last decades, there has been a progressive increase in the rate of deliveries by caesarean section (CS) in most countries but the drivers for this trend are not completely understood (1, 2). Rising CS rates are a major public health concern and cause worldwide debates due to potential maternal and perinatal risks associated with this increase, inequity in access and cost issues (3-7).

In order to understand the drivers of this trend and to propose and implement effective measures to reduce or increase CS rates where needed, it is necessary to have a tool to monitor and compare CS rates in a same setting over time and between different settings.

Traditionally, at facility level, we have monitored CS rates using the overall percentage of deliveries by CS. Variations in this “overall CS rate” between different settings or over time are difficult to interpret and compare because of intrinsic differences in hospital factors and infrastructure (e.g. primary versus tertiary level), differences in the characteristics of the obstetric population (“case-mix”) served (e.g. percent of women with previous CS) and differences in clinical management protocols (e.g. conditions for induction or pre-labour CS). **Ideally, there should be a classification system to monitor and compare CS rates at facility level in a standardized, reliable, consistent and action-oriented manner** (3, 8-10).

This classification system should be applicable internationally and it should also be useful for clinicians, facility administrators, public health authorities and women themselves.

Such a system should be simple, clinically relevant, accountable, replicable and verifiable (10, 11). The lack of such an internationally-recognized system has helped to fuel controversies and to maintain

common myths about the causes for increasing CS rates as well as potential risks and benefits of increasing CS rates.

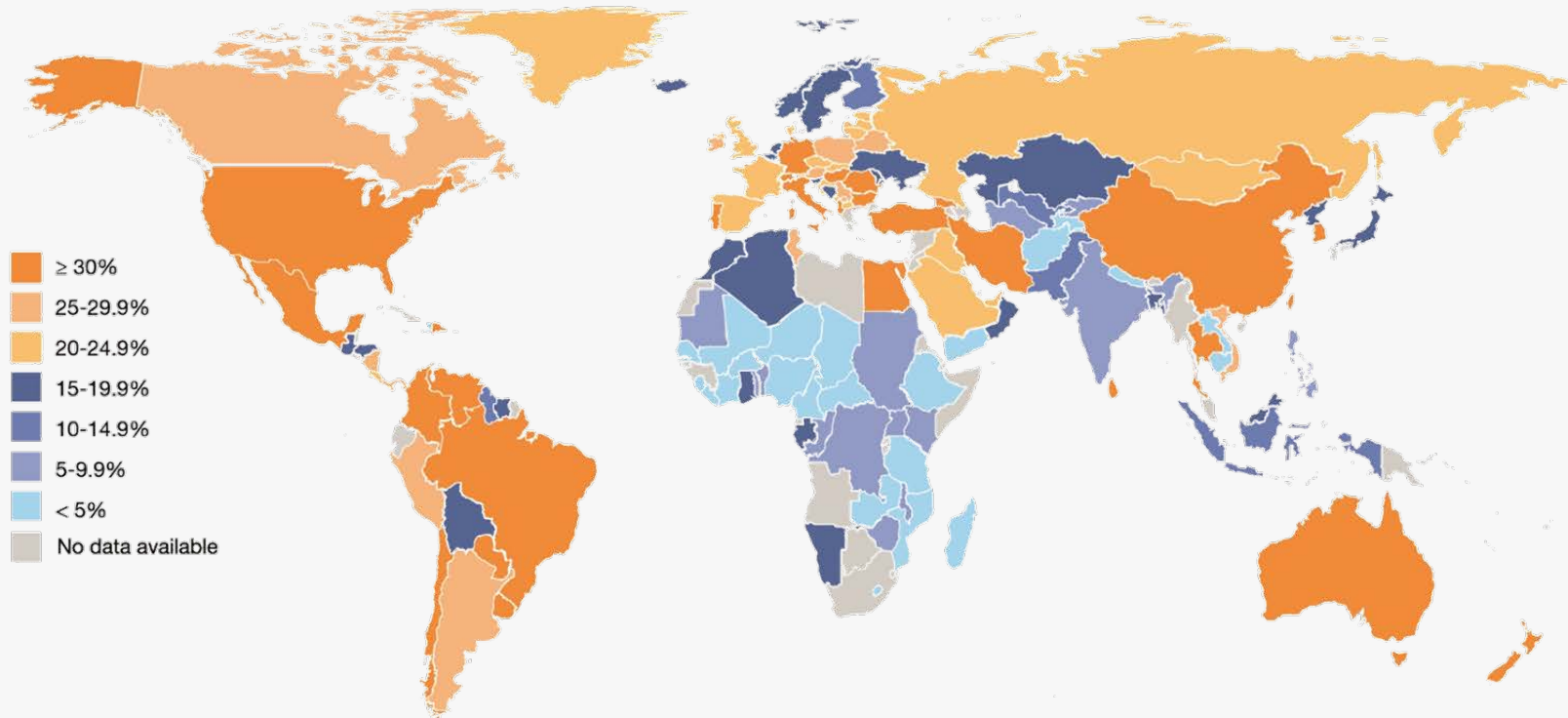


Figure 1: Latest available data on caesarean section rates by country (from 2005 and later). From: The Increasing Trend in Caesarean Section Rates: Global, Regional and National Estimates: 1990-2014 (1).

Different authors have created and proposed several types of CS classification systems for use at facility level for different purposes, with the overall aim of providing a consistent and standardized framework to look at CS (10). In 2011 the World Health Organization (WHO) conducted a systematic review that identified 27 different systems to classify CS. These classifications looked at “who” (woman-based), “why” (indication-based), “when” (urgency-based), as well as “where”, “how” and “by whom” a CS was performed (10).

This review concluded that women-based classifications in general, and the 10-Groups classification in particular (9), were in the best position to fulfill current international and local needs.

The 10-Groups classification (also known as the “TGCS-Ten Groups Classification System” or the “**Robson Classification**”) was created to prospectively identify well-defined, clinically relevant groups of women admitted for delivery and to investigate differences in CS rates within these relatively homogeneous groups of women (9).

Unlike classifications based on indications for CS, **the Robson Classification is for “all women” who deliver at a specific setting** (e.g. a maternity or a region) and **not only for the women who deliver by CS. It is a complete perinatal classification.**

Since this system can be used prospectively and its categories are totally inclusive and mutually exclusive, every woman who is admitted for delivery can be immediately classified, based on a few basic characteristics which are usually routinely collected by obstetric care providers worldwide.

The classification is **simple, robust, reproducible, clinically relevant, and prospective**. It allows the comparison and analysis of CS rates within and across these groups of women. Even before official endorsement by an international institution or formal guidelines recommending its use in 2015, the Robson Classification had been rapidly and increasingly used by many countries all over the world. In 2014 WHO conducted another systematic review to gather the experience of the users of the Robson Classification, to assess the pros and cons of its adoption, implementation and interpretation, and to identify barriers, facilitators and potential adaptations (11).

This review included 73 publications from 31 countries that reported on the use of Robson Classification between 2000-2013. According to users, most of whom were care providers, the main strengths of this classification are its simplicity, robustness, reliability and flexibility (11).

However, users also reported that missing data, misclassification of women, and lack of definition or consensus on core variables of the classification were challenges in its implementation and use.

In October 2014, WHO convened a panel of experts. After reviewing the evidence, the panel proposed the use of the Robson Classification at facility level in order to establish a common point for comparing maternal and perinatal data within facilities over time and between facilities (3, 8).

The panel also decided to adopt the “Robson Classification” as the official name for this classification.

WHO statement on Robson Classification

“WHO proposes the Robson Classification system as a global standard for assessing, monitoring and comparing caesarean section rates within healthcare facilities over time, and between facilities”.



02. Purpose and target audience of this manual

“THIS MANUAL WAS CREATED TO ASSIST HEALTHCARE FACILITIES”

This manual was created to assist healthcare facilities in adopting and using the Robson Classification. It is targeted at health professionals responsible for the care of women admitted for delivery and at administrators responsible for the management of healthcare facilities where births occur.

It presents a standard approach to implement and interpret this classification.



WHAT can the Robson Classification do for you?

WHO expects that the use of the Robson Classification will help health care facilities to:

- Identify and analyze the groups of women which contribute most and least to overall CS rates.
- Compare practice in these groups of women with other units who have more desirable results and consider changes in practice.
- Assess the effectiveness of strategies or interventions targeted at optimizing the use of CS.
- Assess the quality of care and of clinical management practices by analyzing outcomes by groups of women.
- Assess the quality of the data collected and raise staff awareness about the importance of this data, interpretation and use.

This manual:

- Helps you to understand and implement the Robson Classification and build the Report Table using your own data
- Explains the variables and definitions used and how to produce and interpret the Report Table
- Highlights challenges that you may encounter and shares useful experiences and examples from users
- Presents frequently asked questions and answers when classifying women

03. The Robson Classification

“EVERY WOMAN ADMITTED TO DELIVER IN ANY FACILITY CAN BE CLASSIFIED INTO ONE OF THE 10 GROUPS”

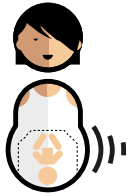
The system classifies all women admitted for delivery into one of 10 groups that are mutually exclusive and totally inclusive. This means that, based on a few basic obstetric variables, every woman admitted to deliver in any facility can be classified into one, and only one, of the 10 groups and no woman will be left out of the classification.

The Robson Classification is for “all women” who deliver at a specific setting and not only for the women who deliver by CS.

3.1 The 10 groups of the Robson Classification

GROUP

1



Nulliparous women with a single cephalic pregnancy, ≥ 37 weeks gestation in spontaneous labour

GROUP

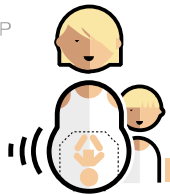
2



Nulliparous women with a single cephalic pregnancy, ≥ 37 weeks gestation who either had labour induced or were delivered by caesarean section before labour

GROUP

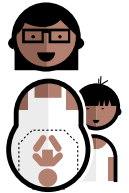
3



Multiparous women without a previous uterine scar, with a single cephalic pregnancy, ≥ 37 weeks gestation in spontaneous labour

GROUP

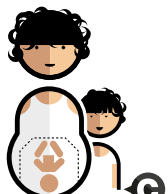
4



Multiparous women without a previous uterine scar, with a single cephalic pregnancy, ≥ 37 weeks gestation who either had labour induced or were delivered by caesarean section before labour

GROUP

5



All multiparous women with at least one previous uterine scar, with a single cephalic pregnancy, ≥ 37 weeks gestation

GROUP

6



All nulliparous women with a single breech pregnancy

GROUP

7



All multiparous women with a single breech pregnancy, including women with previous uterine scars

GROUP

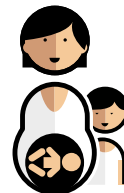
8



All women with multiple pregnancies, including women with previous uterine scars

GROUP

9



All women with a single pregnancy with a transverse or oblique lie, including women with previous uterine scars

GROUP

10



All women with a single cephalic pregnancy < 37 weeks gestation, including women with previous scars

3.2 Definition of core variables

The 10 groups are based on six basic obstetric variables; these are the only information needed to classify each woman (Table 1).

Table 1: Obstetric variables for the Robson Classification

| Obstetric variables | |
|----------------------------|--|
| Parity | <ul style="list-style-type: none"> • Nullipara • Multipara |
| Previous CS | <ul style="list-style-type: none"> • Yes (one or more) • No |
| Onset of labour | <ul style="list-style-type: none"> • Spontaneous • Induced • No labour (pre-labour CS) |
| Number of fetuses | <ul style="list-style-type: none"> • Singleton • Multiple |
| Gestational age | <ul style="list-style-type: none"> • Preterm (less than 37 weeks) • Term (37 weeks or more) |
| Fetal lie and presentation | <ul style="list-style-type: none"> • Cephalic presentation • Breech presentation • Transverse lie |

In principle, since these variables are routinely collected and used in the clinical management of women admitted for delivery, you should be able to obtain this data from each woman's medical record.

3.2 Definition of core variables

Table 2: Definition of core variables used in the Robson Classification

| Obstetric Variable | Definition | Observation |
|----------------------|---|---|
| Parity* | Number of previous deliveries upon admission for delivery. | Birth of infant weighing ≥ 500 g or ≥ 22 weeks**, alive or dead, with or without malformations, by any route. The number of previous abortions/miscarriages does not count. |
| Nullipara | No previous delivery. | This is not necessarily equivalent to Primigravida. For example, a woman in her 4 th pregnancy with 3 prior miscarriages (G4 PO A3) will be a nulliparous woman and belongs in this group. |
| Multipara | At least one previous delivery. | Delivery of infant weighing ≥ 500 g or ≥ 22 weeks**, alive or dead, with or without malformations, by any route. |
| Previous CS * | Number of previous CS upon admission for delivery. | Other types of uterine scars (e.g. myomectomy) should not be considered and not included as a prior CS when classifying women. |
| None | All previous deliveries were vaginal. | |
| One or more | At least one previous delivery by CS but may have one or more vaginal deliveries in addition. | |

*** The definition does not consider the current delivery.** The woman should be classified **before** she delivers. For example, a woman who is admitted to deliver her first baby should be classified as a “Nullipara”, even if the forms are filled after she has already delivered; she should not be classified as a multipara. Similarly, a woman who has two previous vaginal deliveries and is admitted for an elective CS should be classified as having “No previous CS”, even if the forms are filled after the delivery of her third baby.

** This definition may vary in different settings (see Box below). Users of the classification should specify their definition for “birth” (minimum gestational age and birthweight) if this differs from the one proposed here and report this as a footnote in their Report Table (see below). It is not encouraged but if the users decide to exclude stillborn and malformed fetuses from the classification, this should also be reported in the footnote.

Table 2 (Continued): Definition of core variables used in the Robson Classification

| Obstetric Variable | Definition | Observation |
|--------------------------|--|--|
| Onset of labour | How labour and delivery started in the current pregnancy, regardless of how delivery was planned originally. | This should be based on the history, physical examination and decision by health professional upon admission to the labour/delivery ward. |
| Spontaneous | Prior to delivery, the woman was in spontaneous labour . | Nulliparous or multiparous women with a scheduled (prelabour) CS who arrive in spontaneous labour belong to this group. This group also includes women who entered labour spontaneously and then received oxytocin or had an amniotomy performed for augmentation (acceleration) of labour. |
| Induced | Upon admission to the labour ward, the woman was not in labour and was then induced. | Any method of induction is valid including amniotomy, misoprostol, oxytocin, intracervical Foley balloon, laminaria or other. Women who enter labour spontaneously and then receive oxytocin or have an amniotomy to correct dystocias or augment (accelerate) labour do not belong in this group but should be classified as "Spontaneous" onset of labour. |
| Pre-labour CS | Woman not in labour when admitted for delivery and a decision was taken to deliver by CS. | Cases of induction or spontaneous labour who ultimately were delivered by CS do not belong here . |
| Number of fetuses | Number of fetuses upon admission for delivery. | Including fetal deaths diagnosed after 22 weeks or 500 g**. |
| Singleton | One fetus. | Twin pregnancies with fetal demise prior to 22 weeks or 500 g should be counted as a singleton pregnancy |
| Multiple | More than one fetus. | Including cases of multiples where one or more fetuses died after 22 weeks or 500 g**. |

** This definition may vary in different settings (see Box below). Users of the classification should specify their definition for "birth" (minimum gestational age and birthweight) if this differs from the one proposed here and report this as a footnote in their Report Table (see below). It is not encouraged but if the users decide to exclude stillborn and malformed fetuses from the classification, this should also be reported in the footnote.

Table 2 (Continued): Definition of core variables used in the Robson Classification

| Obstetric Variable | Definition | Observation |
|-----------------------------------|--|---|
| Gestational age | Gestational age upon admission for current delivery. | Based on best estimate (menstrual or earliest ultrasound) or neonatal exam or definitions used in your setting. |
| Term | 37 weeks or more. | |
| Preterm | Less than 37 weeks. | |
| Fetal lie and presentation | The final fetal lie/presentation before a decision for delivery or before a diagnosis of labour is made. | Women admitted with a breech fetus who undergo external version and then deliver a cephalic fetus should be considered as cephalic. Women with a dead fetus in transverse lie who undergo internal version before delivery should be considered breech. |
| Cephalic | Fetal head is the presenting part. | Vertex, face or brow, or compound head presentations (hand prolapse) should go here. |
| Breech | Fetal buttocks or one foot or two feet are the presenting part. | All types of breech (frank, complete and footling). |
| Transverse or Oblique lie | Fetal long axis is perpendicular or oblique in relation to the mother's long axis. | The fetal shoulder or arm are presenting or there is no presenting part. |



The Robson Classification should be considered as a common starting point for a perinatal classification system that can be further developed. Each of the 10 groups may need to be subdivided or some groups may need to be combined. In addition, more details such as indications for caesarean sections or neonatal morbidity can be added and analysed within the different groups. Other events and outcomes related to labour and delivery can also be analysed within the group (e.g. oxytocin or epidemiological variables such as age or body mass index).

Moreover, there are several key obstetrical definitions, protocols or procedures which are not included in the classification but should be considered when interpreting the results.

These may be specific to each health facility and sometimes standard across countries.

They include for example, the criteria used for diagnosis of labour (cervical effacement and dilatation), the guidelines used for management of labour including artificial rupture of membranes, oxytocin regimen used for augmentation (acceleration) and induction, diagnosis and treatment of arrest of labour and dystocia, fetal monitoring techniques, analgesia and one to one care in labour.

HOW to define a birth

The definition of a “**birth**” may vary between countries and settings. While most high-income countries count births as infants weighing at least **500 g** or with a gestational age at least **20 or 22 weeks**, many countries use other cut-offs. For example, the threshold of viability in many countries is **birth weight \geq 1000 g and gestational age \geq 28 weeks**.

In order to compare Robson Report Tables between countries and within countries over time, it is important that the users of the classification give a clear definition of what were the weight and gestational age cutoffs used in their population. This should be added as a footnote in their Robson Report Table.

3.3 Subdivisions for the 10 groups

Many users of the Robson Classification have suggested subdivisions in the 10 Robson groups (12). Subdivisions of certain groups (e.g. Groups 2, 4 or 5) may prove to be more meaningful than others, but this can vary from site to site. The objective of the subdivisions is to further increase the uniformity and homogeneity of the groups by stratifying women within that group according to certain relevant characteristics.

This can be especially useful when planning the implementation of clinical interventions in specific subgroups. The importance and potential usefulness of these subdivisions will depend on the size of the groups within the specific setting where the classification will be used. However, it is important to remember that the analyses of any subdivision by itself may be misleading if no attention is given to what has been left out.

For this reason it is recommended that before looking at subgroups users become accustomed to first analyse the 10 groups. Otherwise, the data may be misinterpreted.

Table 3 presents the Robson Classification with the most common subdivisions.



3.3 Common subdivisions for the 10 groups

Table 3. The Robson Classification with subdivisions

| Group | Obstetric population |
|-----------|---|
| 1 | Nulliparous women with a single cephalic pregnancy, ≥ 37 weeks gestation in spontaneous labour |
| 2 | Nulliparous women with a single cephalic pregnancy, ≥ 37 weeks gestation who had labour induced or were delivered by CS before labour |
| 2a | Labour induced |
| 2b | Pre-labour CS |
| 3 | Multiparous women without a previous CS, with a single cephalic pregnancy, ≥ 37 weeks gestation in spontaneous labour |
| 4 | Multiparous women without a previous CS, with a single cephalic pregnancy, ≥ 37 weeks gestation who had labour induced or were delivered by CS before labour |
| 4a | Labour induced |
| 4b | Pre-labour CS |
| 5 | All multiparous women with at least one previous CS, with a single cephalic pregnancy, ≥ 37 weeks gestation |
| 5.1 | With one previous CS |
| 5.2 | With two or more previous CSs |
| 6 | All nulliparous women with a single breech pregnancy |
| 7 | All multiparous women with a single breech pregnancy including women with previous CS(s) |
| 8 | All women with multiple pregnancies including women with previous CS(s) |
| 9 | All women with a single pregnancy with a transverse or oblique lie, including women with previous CS(s) |
| 10 | All women with a single cephalic pregnancy < 37 weeks gestation, including women with previous CS(s) |

3.3 Common subdivisions for the 10 groups

Groups 2 and 4 subdivisions:

These groups refer to nulliparous and multiparous women without previous CS, respectively, with a singleton, term fetus in cephalic presentation who did not enter labour spontaneously (See Table 3). These groups include two distinct and mutually exclusive subcategories, namely:

2a or 4a

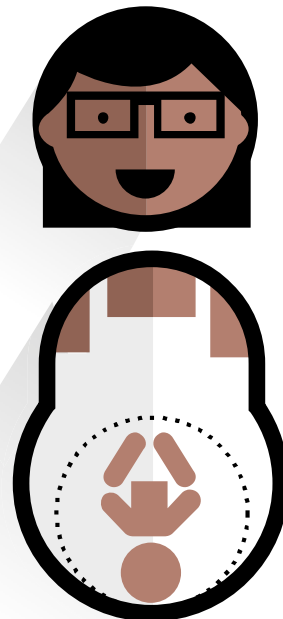
Nulliparous or multiparous women, respectively, who had their labour induced (using any method, such as misoprostol, oxytocin, amniotomy or intracervical Foley catheter or other) and went on to deliver vaginally or by CS

2b or 4b

Nulliparous or multiparous women, respectively, who were admitted and delivered by pre-labour CS. Since all the women in these subgroups will have a CS, the rates of CS in these subgroups will always be 100%.

Since Groups 2 and 4 may represent a large proportion of the obstetric population in many hospitals, these subcategories are important to understand how differences in clinical practice (rates of induced labour or pre-labour CS) contribute to the rates of CS in nulliparous and multiparous women without a previous CS, as well as the overall CS rates in different hospitals.

Additionally, the rate of CS in Subgroups 2a and 4a (induced nulliparous and multiparous women, respectively) can also be used to assess and compare the success of induction guidelines in different hospitals or in the same hospital over time.



3.3 Common subdivisions for the 10 groups

Group 5 subdivisions:

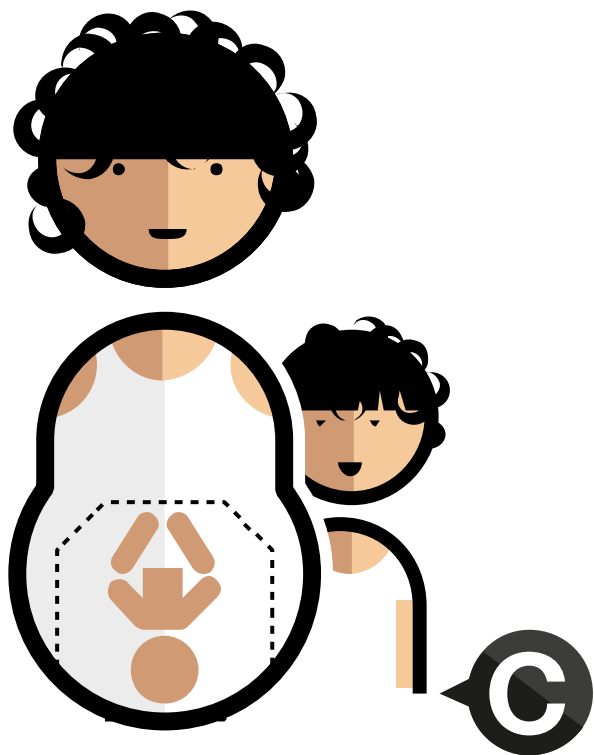
Group 5 includes all multiparous women with at least one previous CS carrying a singleton, term fetus in cephalic presentation. In current obstetric practice, Group 5 can be very important in many settings because there is a growing number of women with previous CS and therefore the size of this group may be quite significant. Since the rate of CS in this group is usually high, Group 5 may be an important contributor to the total number of CS in these settings. However, Group 5 includes two distinct and mutually exclusive subcategories, namely:

5.1 Multiparous women with only one previous CS

5.2 Multiparous women with two or more previous CS.

Given the differences in clinical management of these two types of women, these common subcategories should be reported separately in the classification, as 5.1 and 5.2.

The usefulness of these subcategories will depend on the actual size of Group 5 in a specific setting. In many high- and middle-income countries where the size of Group 5 is becoming substantial, the proposed subcategories will be more useful and appreciated than in places where Group 5 represents only a small proportion of the obstetric population.



3.4 Cases with missing variables (Unclassifiable Cases)

The 10 groups are based on basic obstetric characteristics that are routinely collected in most pregnancies at admission and on delivery. In cases where the information on one or more of the core variables is missing or illegible in the patient record, it will not be possible to classify the woman in any of the 10 groups. This “unclassifiable group” of women should be reported as part of the Robson Classification Report Table but preferably placed as a footnote at the bottom of this table.

It is very important to report this group and its size (absolute N and % over total deliveries) because **it is an indicator of the quality of the data available in any hospital.**

It is also important to explore which are the exact variables that are missing in this group of women, in order to improve future data collection.

USEFULNESS of quantifying and exploring Unclassifiable Cases

In 2017, hospital A had a total of 2500 deliveries and 250 (10%) could not be classified in any of the Robson groups. Upon reviewing these specific records, it was seen that the missing information was mostly fetal presentation (n=200/250 cases). In this hospital, it will be relatively simple to reduce the number of “unclassifiable cases” by properly filling the information on fetal presentation, which is easily available in all patient records.

On the other hand, in hospital B, which has 7500 deliveries per year, there were 225 records that were unclassifiable (3%) and the most frequently missing variable was onset of labour and delivery (i.e. including pre-labour CS) (n=218/225 cases).

It would seem that the managers of hospital B will probably need to invest less efforts to improve data collection as the unclassifiable group is smaller than in hospital A. However, the information missing in Hospital B (onset of labour and delivery) is less objective than the information missing in Hospital A (fetal presentation). To reduce the number of unclassifiable cases due to missing information on labour onset, the clinicians could consider adding a new field in their admission forms to collect this specific information in all cases. For example at one point in the data collection prior of the delivery, all women must have one of the following three options collected: spontaneous labour, induced labour or pre-labour CS. The midwifery and obstetric staff would have to agree on the hospital’s definition of what constitutes spontaneous labour and ensure that all health care providers understand and implement this definition when filling this field.

04. Frequent questions on how to classify women

QUESTIONS ABOUT...

In the next pages you will find answers to common questions on how to classify women in the Robson groups.



Questions about parity

Q 1: I just performed a CS because of fetal distress on a nullipara who arrived in labour (8 cm) with a singleton, cephalic pregnancy at term. Should I classify this case in Group 1 or Group 5?

A 1: This woman should be classified as Group 1. The classification does not take into account the current delivery. Therefore, this woman is a nullipara and not a multipara with a previous CS.

Q 2: How should I classify a woman with 5 previous term deliveries who delivers a cephalic stillborn infant at 26 weeks, weighing 620 g? In my country, we register liveborn infants weighing at least 500 g but we do not register stillborn infants weighing less than 1000g.

A 2: This woman would belong in Group 10. However, you can decide not to include this case in the Robson Classification because of the definitions used in your setting. In this case, at the bottom of the Robson Classification Report Table you should add a footnote specifying what were the criteria that you used for “birth”.

For example, you could state in the footnote “We included only liveborn infants weighing $\geq 500\text{g}$ and stillborn infants weighing $\geq 1000\text{g}$.”

Q 3: How do I classify a woman in her fourth pregnancy, with 3 previous miscarriages (at 8, 12 and 14 weeks), who is admitted at 38 weeks in spontaneous labour with a single cephalic fetus? Does she belong to Group 1 or 3?

A 3: She belongs in Group 1 because she is a nullipara (i.e. she never delivered an infant weighing at $\geq 500\text{g}$ or ≥ 22 weeks gestation).

Q 4: A nullipara with a history of previous myomectomy two years ago is admitted for a pre-labour CS at 38 weeks, with a singleton cephalic fetus. Should she be classified in Group 2 or in Group 5?

A 4: This woman belongs to Group 2 (Group 2b). Only women with uterine scars due to one (or more) CS should be classified in Group 5.



Q 5: How do I classify a woman admitted for induction of labour at 41 weeks who has one previous vaginal delivery? I would tend to classify her as Group 1 because in my country, we call her a primipara; we use the word 'multipara' only for women who have had at least two previous deliveries.

A 5: For the Robson Classification, all women with one or more previous births are classified as "Multiparous women". Therefore, this woman belongs in Group 4.



Questions about onset of labour

Q1: I admitted a nullipara with a singleton, cephalic pregnancy at 40 weeks with ruptured membranes 4 hours ago and regular contractions for the last hour. Upon admission she was 2 cm cervical dilated, 80% effaced with moderate contractions every three minutes, which corresponds to the hospital's definition of spontaneous labour. Four hours after admission, she is still 2 cm dilated and I give her oxytocin to augment (accelerate) labour. Should I classify her in Group 1 or Group 2?

A1: This woman belongs in Group 1, since she is a nullipara with spontaneous onset of labour. (according to your definition of spontaneous labour). The use of oxytocin in this case is for labour augmentation (acceleration) and not for induction. Therefore she does not belong to Group 2 which is exclusively for women who were admitted and diagnosed not in spontaneous labour and are induced using any method (pharmacological or mechanical).

Q 2: I admit a 41 year old obese multipara (3 previous vaginal deliveries) at 40 weeks with a single, cephalic fetus, in spontaneous labour with 4 cm cervical dilation. She has gestational diabetes, the fetus is macrosomic and she was scheduled for an elective CS fetus on the following day. Should she be in Group 3 or Group 4b?

A 2: She belongs in Group 3 because onset of labour was spontaneous and the classification always considers how labour started in the current pregnancy, regardless of how delivery was planned.



Questions about multiple pregnancies

Q 1: If I have a woman who has a twin pregnancy and the first baby is in a transverse lie, should I classify this case in Group 8 or Group 9?

A 1: She belongs in Group 8, since it includes “All women with multiple pregnancies”. Group 9 is for only for women with a singleton pregnancy with a fetus in transverse or oblique lie.

Q 2: A nullipara was diagnosed with a triplet pregnancy at 14 weeks. At 22 weeks, there was only one live fetus on ultrasound examination and the other two dead fetuses had estimated weights of < 500 g. She presents at 39 weeks in spontaneous labour, the live fetus is in cephalic presentation. How should I classify this woman: in Group 8 or in Group 1?

A 2: This case belongs to Group 1. The classification does not apply to pregnancies/fetuses with estimated fetal weight less than 500 g or gestational age less than 22 weeks.



Q 3: A 42 year old multipara (2 previous CS) was diagnosed by ultrasound with a twin pregnancy at 10 weeks. At 31 weeks, she is admitted because of severe preeclampsia and fetal growth restriction, with both fetuses alive. On the second day, one of the fetuses dies. She is immediately taken to the labour ward for a pre-labour CS. The presenting fetus is breech and dead. The surviving fetus is cephalic. How should I classify this woman: in Group 5.2, Group 7 or Group 8?

A 3: This case belongs to Group 8. The fetal demise occurred after 22 weeks (or after > 500 g of fetal weight), therefore this pregnancy is still considered a multiple. She does not belong to Group 5 because only women at term with a single, cephalic fetus should be included in this group. She does not belong in Group 7 because it is only for singleton breeches.

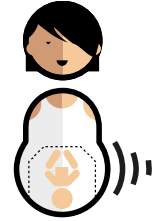
Q 4: I have a total of 3000 women who delivered in my hospital in 2015; 60 of these women delivered twins and 1 woman delivered triplets. Therefore, my total number of babies delivered in 2015 was 3062. When I construct the main Robson Report Table for my hospital in 2015, my total number (last line in Column 2) should be 3000 or 3062?

A 4: The total number of the Robson Classification Report Table refers to the total number of WOMEN delivered in a setting and not the total number of babies. Therefore, the correct total number is 3000.

The Robson Classification refers to **the women** who deliver in a setting and not to the babies

GROUP

1



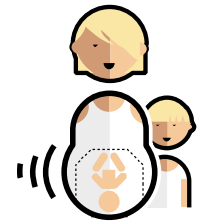
GROUP

2



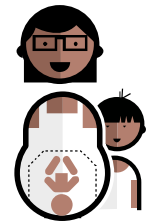
GROUP

3



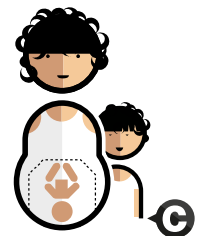
GROUP

4



GROUP

5



Questions about presentation

Q1: How should I classify a nullipara in spontaneous labour at 38 weeks, 8 cm dilated, with a face presentation?

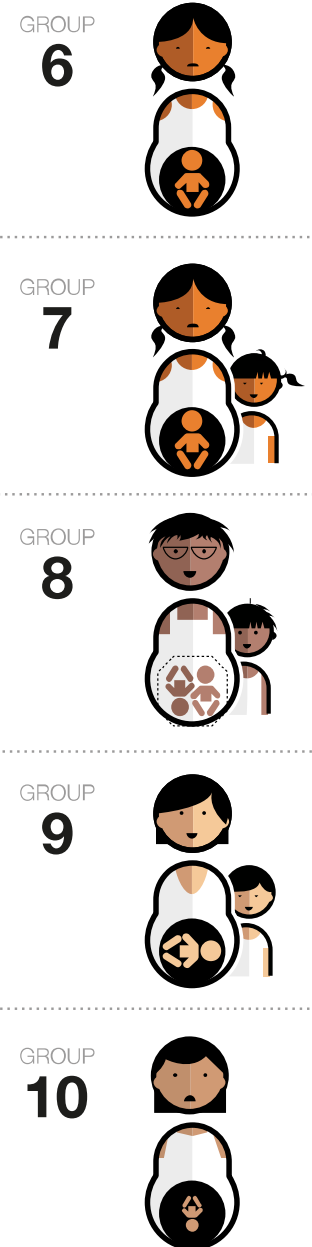
A1: This woman belongs in Group 1. All face, brow or compound cephalic presentations should be categorized in Group 1. As long as the presenting part is the fetal head, this is considered a cephalic presentation.

Q2: I admit a woman with 3 previous vaginal deliveries in spontaneous labour at 39 weeks, 5 cm dilated, with ruptured membranes, and a singleton fetus in cephalic presentation with a hand alongside the head. Should I classify her in Group 3 or in Group 9?

A2: This woman should be in Group 3. As long as the presenting part is the fetal head, this is considered a cephalic presentation. Group 9 is only for women in transverse or oblique lie possible with a prolapsed arm which is not the case here.

Q3: I admit a nullipara with a singleton breech fetus at 37 weeks, not in labour. She is submitted to a successful external version and is induced immediately after. Within 12 hours she delivers a fetus in cephalic presentation by the vaginal route. How do I classify this woman: in Group 6 or in Group 2a?

A3: This woman should be classified in Group 2a. The Robson Classification uses the final fetal presentation/lie before a decision for delivery or before a diagnosis of labour is made. In this case, the presentation at onset of induction was cephalic, therefore she belongs in Group 2a.



Questions about gestational age, fetal demise and fetal malformations

Q 1: A nulipara arrives at 32 weeks, fully dilated, with a live singleton cephalic fetus and umbilical cord prolapse. Should this woman be classified in Group 1, 10 or Group 9?

A 1: She belongs to Group 10 because it includes all preterm singleton, cephalic pregnancies. Group 1 is not for her because her pregnancy is not at term (37 weeks or more) and Group 9 is only for transverse or oblique lies, which is not her case.

Q 2: A multipara with 2 previous CS is admitted at 30 weeks, with severe pre-eclampsia, not in labour, with a dead fetus in breech presentation. Should this woman be included in the Robson Classification at all since her fetus is dead? If we classify her, does she belong in Group 5, Group 7 or Group 10?

A 2: The Robson Classification does not exclude stillbirths; therefore, this woman should be included in the classification. She belongs in Group 7 because it includes "All multiparous women with a single breech including those with previous CS". She does not belong in Group 5 or Group 10 because the fetus is breech and these groups only include cephalic presentations.

Q 3: A nulliparous woman with an anencephalic fetus is admitted at 24 weeks for induction. The fetus is dead and in a cephalic presentation. Should we classify her at all in the Robson Classification? If we classify her, should she be categorized in Group 2 or Group 10?

A 3: The Robson Classification does not exclude malformed or dead fetuses; therefore, this woman should be included in the classification. She belongs in Group 10, which includes all women with a single cephalic preterm fetus; the fact that the fetal head has a malformation does not change the fact that the presentation is still cephalic. Group 2 is for term, cephalic presentation, which is not the case here.

05. Ways of classifying women in the Robson groups

“YOU **DO NOT** NEED A TEAM OF INFORMATION SPECIALIST”

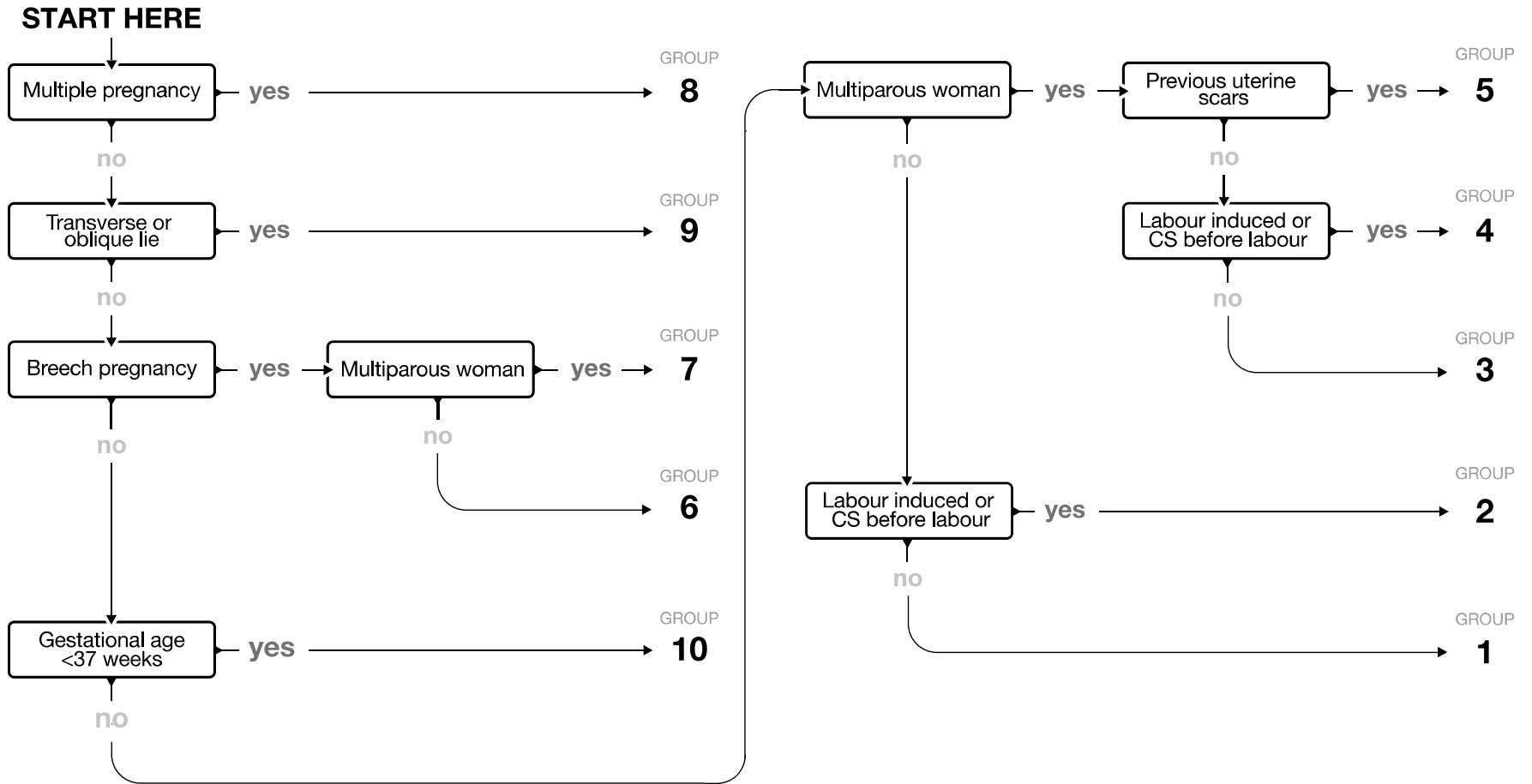
There are different ways that you can use to classify each woman into one of the 10 Groups. It can be as simple as going manually through each patient record looking for the core variables and adding a manual note with a pencil to the cover of the patient record with the number of the Robson group. On the other hand, it can be as complex as asking a team of information specialists to create a software which picks the core variables in the electronic patient record and automatically assigns the specific Robson group to each record, based on pre-established formulas.

The flow chart in the next page provides guidance about the order in which the categorization can be most easily performed.

Cases with missing data (no information in one or more of the six core variables) should be categorized as “Unclassifiable” and the missing variable should be noted to facilitate analyses of these cases.



Figure 2: Flow chart for the classification of women in the Robson Classification



Source: Adapted from Nassar LF, Sancho HD. Instrucción de Robson . v.0.1-1. 2015/06/08. Caja Costarricense de Seguro Social)

5.1 Manually

Each woman can be classified manually into one of the 10 groups by reviewing and collecting data from each individual record or directly from delivery room registers (log books) if they provide the required variables listed in Table 1 or using the definitions presented in Table 3 . Once the woman is classified, her specific group can be marked in her record or in a newly created column in the delivery room log book. This marking can be used to facilitate periodic (e.g. monthly) calculations of the number of women in each group. To facilitate the classification of each woman, you can print a copy of the flow chart presented in the previous page (Figure 2) and follow the steps provided in it.

5.2 Using a spreadsheet or an automatic calculator

This form of classification is possibly superior to the manual collection as it reduces human errors in deciding to which group each woman belongs. However, it requires that each of the basic variables for each woman be typed into an electronic spreadsheet.

You could for example set up a spreadsheet table (see Table 4 in the next page) where each row corresponds to a woman and each column corresponds to one of the basic variables with specific possible answers for each variable. You then create an additional last (or first) column called “Group Number” where, by the means of electronic formulas with the rules for classification, each woman would automatically be assigned to a Robson group.

The table in the next page can be useful for information specialists in your hospital to create the electronic formulas to classify all women into one of the 10 Robson groups, based on the six core variables.



5.2 Using a spreadsheet or an automatic calculator

Table 4: Summary of specifications for variables in each Robson group

| Group | Parity | Previous CS | Number of fetuses | Fetal presentation or lie | Gestational age (weeks) | Onset of labour |
|-------|--------|-------------|-------------------|---------------------------|-------------------------|-----------------------------|
| 1 | 0 | No | 1 | Cephalic | ≥ 37 | Spontaneous |
| 2 | 0 | No | 1 | Cephalic | ≥ 37 | Induced or CS before labour |
| 3 | ≥1 | No | 1 | Cephalic | ≥ 37 | Spontaneous |
| 4 | ≥1 | No | 1 | Cephalic | ≥ 37 | Induced or CS before labour |
| 5 | ≥1 | Yes | 1 | Cephalic | ≥ 37 | Any |
| 6 | 0 | No | 1 | Breech | Any | Any |
| 7 | ≥1 | Any | 1 | Breech | Any | Any |
| 8 | Any | Any | ≥ 2 | Any | Any | Any |
| 9 | Any | Any | 1 | Transverse or Oblique | Any | Any |
| 10 | Any | Any | 1 | Cephalic | < 37 | Any |

5.3 Via electronic records

If your hospital uses electronic patient records, we suggest that you contact the information support team, show them the basic obstetric variables needed to classify women in one of the 10 groups (Table 4 above) and the Flow Chart used for manual classification (Figure 2) and ask them to create the necessary formulas to automatically classify all women who are admitted for delivery.

They can also use this to create the Robson Report Table.

06. The Robson Classification Report Table

“THE DATA IS **BEST REPORTED** IN A STANDARDIZED WAY”

In order to make the most of the information provided by the Robson Classification in local settings and to allow comparisons between settings, the data is best reported in a standardized way (the “Robson Classification Report Table”).



The Report Table consists of seven columns as follows:

| Column 1 | Column 2 | Column 3 | Column 4 | Column 5 | Column 6 | Column 7 |
|--|----------------------------------|---|--|---|--|---|
| Group name and/or number and definition (with subdivisions for Groups 2, 4 and 5, if these are of interest to the users) | Total number of CS in each group | Total Number of women delivered in each group | Relative group size to overall facility population. For each of the 10 groups, in percentage | CS rate in each group. For each of the 10 groups, in percentage | Absolute group contribution to overall CS rate. For each of the 10 groups, in percentage | Relative contribution of each of the 10 groups to overall CS rate. For each of the 10 groups, in percentage |

We suggest that you start by filling in Columns 2 and 3 (total number of CS and total number of women in each of the 10 groups) to then perform all the percent calculations.

06. The Robson Classification Report Table

Table 5: The Robson Classification Report Table

| Setting name: <i>Hospital ABC</i> | | | | period: <i>January 2016 to December 2016</i> | | |
|-----------------------------------|------------------------|-------------------------------------|-----------------------------|--|---|--|
| Column 1 | Column 2 | Column 3 | Column 4 | Column 5 | Column 6 | Column 7 |
| Group | Number of CS in group | Number of women in group | Group Size ¹ (%) | Group CS rate ² (%) | Absolute group contribution to overall CS rate ³ (%) | Relative contribution of group to overall CS rate ⁴ (%) |
| 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 | | | | | | |
| 6 | | | | | | |
| 7 | | | | | | |
| 8 | | | | | | |
| 9 | | | | | | |
| 10 | | | | | | |
| Total* | Total number CS | Total number women delivered | 100% | Overall CS rate | Overall CS rate | 100% |

Unclassifiable: Number of cases and % [Number unclassifiable cases / (Total Number women delivered classified + unclassified) X 100]

* These totals and percentages come from the data in the table.

1. Group size (%) = n of women in the group / total N women delivered in the hospital x 100

2. Group CS rate (%) = n of CS in the group / total N of women in the group x 100

3. Absolute contribution (%) = n of CS in the group / total N of women delivered in the hospital x 100

4. Relative contribution (%) = n of CS in the group / total N of CS in the hospital x 100

07. How to interpret the Robson Classification Report Table

“HELPS TO UNDERSTAND THE **TYPE OF POPULATION** SERVED BY THE HOSPITAL”

The interpretation of the Robson Classification Report Table can lead to useful insights into the quality of data collection, the type of population served by the hospital, the CS rates of each group and how each of the individual 10 groups contributes to the overall rate of CS in your setting, and the overall philosophy of care of in a maternity unit.



Readers should remember that in settings with low volumes of delivery, the interpretation should take into account the effect of small changes in numbers on the percentages.

One of the principles behind the Robson Classification is that no women are excluded from it and before investigating in more detail any one particular group, it is important to assess the sizes of all the 10 groups to ascertain the balance and makeup of the whole obstetric population.

Doing this will usually identify any obvious data collection problems (validation) and also identify unique populations.

No individual group should be interpreted unless the whole 10 groups are analysed first.

The interpretation of the data provided in the Robson Classification Report Table can be facilitated by following a series of steps that we have divided into three main domains:

1) data quality, 2) type of population and 3) caesarean section rates. In the “Data Quality” domain (Table 6) we have a few simple steps that will help to check if you need to improve your data collection. The steps in the “Type of Population” domain (Table 7) will help you understand better the characteristics of the women delivered in your hospital.

This information can be used for trend analyses, i.e. to help you see if this population is stable or has been changing over the course of months or years. In the “CS rates” domain (Table 8) you will find steps that will help you to understand and compare the CS rates of each of your 10 groups and identify which groups contribute most to the overall CS rates in your hospital.

GENERAL PRINCIPLES of Interpretation of Robson Report Tables

The main three reasons for differences in sizes of groups or events and outcomes within groups are the following:

- Poor data quality (incorrect information in the patient records or errors in retrieving information from the records)
- Differences in significant epidemiological characteristics of the populations (age, BMI, etc...)
- Differences in clinical practice. Only consider differences in practice after you have evaluated quality and epidemiological variables.

This type of information can be used to analyze changes over time, compare differences between hospitals and to help modify clinical practice to optimize CS rates in specific groups while ensuring good maternal and perinatal outcomes. Safety and quality of care in labour and delivery are ultimately related to maternal and perinatal outcomes, as well as to maternal satisfaction. Ideally, all perinatal outcomes should be analyzed using a standard perinatal classification system and no outcome should be judged in isolation. **The Robson Classification can be used as a tool to judge care rather than to recommend care.** It is up to the hospital itself to decide what is appropriate care, based on its results and other available evidence (12, 13).

The examples in interpretation shown in Tables 6-8 are based on two sources; one was developed by Michael Robson based on his international experience applying the classification since 1990 (9, 14, 15) and the second source is the WHO Multicountry Survey on Maternal and Newborn Health (WHO MCS) (16, 17). **It should be emphasized that neither of these sources has been formally validated and the CS rates by group presented in this table have not been linked to improved outcomes.** In particular, please note that the **rates of CS in each of the Robson groups in the WHO MCS** refer to an average obtained from over 60 health facilities in low- and middle-income countries and therefore **cannot and should not be taken as a recommendation** to be followed by everyone around the world.

The WHO MCS was a cross-sectional study implemented in over 300 health facilities in 29 countries and included over 314,000 women from Africa, Asia, Eastern Mediterranean region, and Latin America (17, 18). Using data from this survey, a “reference population” was created; this consisted of all the facilities with low CS rates and low intra-partum perinatal mortality. These facilities were assumed to have few unnecessary CS and good maternal and perinatal outcomes (16, 19). The “reference population” included 42,637 women from 66 health facilities in 22 countries. The Multicountry Survey Box presents more detailed information on the WHO MCS and the “reference population”.

The steps suggested below use the order of the columns presented in Table 5. These rules should be used only after fully reading and understanding the classification. If your data distribution (size of the groups) looks strange, first suspect poor data quality or the possibility of a unique population. No hospital continuously collects completely accurate data.

Used on a continuous basis, this system can help to point out errors and ultimately improve the quality of data collection.

In the next pages, we present the steps for interpretation of the Robson Classification Report Table

Assessment of **quality of data**

Assessment of **type of obstetric population**

Assessment of **caesarean section rates**

MULTICOUNTRY SURVEY on Maternal and Newborn Health (WHO MCS)

The WHO MCS was a cross-sectional study implemented in 359 health facilities in 29 countries. Countries, provinces and health facilities were randomly selected to participate in the WHO MCS through a stratified, multistage cluster sampling strategy. Health facilities were only eligible if they had at least 1000 deliveries per year and had the capacity to provide CS. Between May 2010 and December 2011, 314,623 women from Africa, Asia, Eastern Mediterranean region, and Latin America were recruited (17, 18).

For the creation of the “reference population” it was considered that the intrapartum related perinatal mortality (i.e. intrapartum stillbirth plus neonatal deaths that took place in the first postpartum day) was a reasonable indicator of quality of care around the time of birth. It was also assumed that health facilities with low CS rates and low intra-partum perinatal mortality had few unnecessary CS and good maternal and perinatal outcomes and thus this population was selected to serve as “reference” (16). The facilities that had both CS rates and intrapartum perinatal mortality below the percentile 50 in the WHO MCS sample of facilities constituted the “reference population”. This specific cut-off (i.e. percentile 50) was selected because the median is commonly used as a reference for defining what is low or high in sufficiently large samples.

Among all the facilities in the WHO MCS, the median (50th percentile) for CS rate was 30% and the median (50th percentile) for the intrapartum related perinatal deaths was 6.8 deaths per 1000 livebirths. Health facilities below these values (i.e. facilities with less than 30% of caesarean births and less than 6.8 intrapartum-related perinatal deaths per 1000 births) constituted the “reference population” that included 42,637 women from 66 health facilities in 22 countries. We used the women delivering in these facilities to construct the Robson Report Table in this section (16).

7.1 Steps to assess quality of data

Table 6: Steps to assess quality of data using the Robson Classification Report Table.*

| Step | Interpretation by Robson | Example: MCS population** | Further Interpretation |
|---|--|---------------------------|--|
| 1. Look at the total numbers of CS and of women delivered in your hospital (last lines of Column 2 and Column 3) | These numbers should be identical to the total number of CS and of women delivered in your hospital. | NA | If these numbers do not match, then data is missing or incorrect. Some women may not have been classified in the Robson groups because of missing variables or were incorrectly classified as to type of delivery. Sometimes multiple pregnancies are counted as babies rather than mothers [#] |
| 2. Look at the size of Group 9 (Column 4) <i>Singletons in transverse or oblique lie</i> | It should be less than 1%. | 0.4% | If this is > 1%, it is probable that women with breech (or other) presentations have been misclassified as transverse /oblique lie and allocated to this group. As the classification includes all women who have delivered, if any one group is smaller or bigger, look to the other groups which sometimes will show where the misclassification is. |
| 3. Look at the CS rate of Group 9 (Column 5): | It should be 100% by convention. | 88.6% | By convention, if the woman gives birth vaginally by internal version, it should be classify as either cephalic or breech. The CS rate in Group 9 should be 100% |

* Columns number refer to Table 5.

** MCS reference population was the population of the MCS with relatively low CS rates and, at the same time, with good outcomes of labour and childbirth

[#] For Unclassifiable cases, see recommendations in 3.d.

7.2 Steps to assess type of population

Table 7: Steps to assess type of population using the Robson Classification Report Table.*

| Step | Robson guideline | Example: MCS population** | Further Interpretation |
|--|---|---------------------------|---|
| 1. Look at the size of Groups 1+ Group 2 (Column 4)- <i>Nulliparous women ≥37 weeks gestation singleton cephalic</i> | This usually represents 35-42% of obstetric population of most hospitals. | 38.1% | In settings with high proportion of women who have only one child rather than more than one child, the group of nulliparous women i.e. Groups 1 and 2 tends to be larger. In settings where the opposite is true, the size of Groups 1+ Group 2 will be smaller since most of the population will be represented by multiparous women |
| 2. Look at the size of Groups 3 + 4 (Column 4)- <i>Multiparous women ≥37 weeks gestation singleton cephalic, without previous CS</i> | This usually represents about 30% of women. | 46.5% | In settings with high proportion of women with more than one child rather than only one child, the size of Groups 3 + Group 4 will be higher than 30% (provided they have delivered vaginally). Another reason for a low size of Groups 3 and 4 could be that the size of Group 5 is very high which would be accompanied by a very high overall CS rate. |
| 3. Look at the size of Group 5 (Column 4) <i>Multiparous women ≥37 weeks gestation singleton cephalic with previous CS</i> | It is related to the overall CS rate. The size of Group 5 is roughly usually about half of the total CS rate. In settings with low overall CS rates, it is usually under 10%. | 7.2% | The size of Group 5 is usually related to the overall CS rate. If the size of this group is larger, it means that there has been a high CS rate in the past years in that hospital and mainly in Groups 1 and 2. In places with high CS rates, the size of this group could be > 15%. |
| 4. Look at the size of Groups 6 + 7 (Column 4) <i>Breeches in nulliparous & multiparous women</i> | It should be 3-4% | 2.7% | If the total is much over 4%, the most common reason is usually a high rate of preterm deliveries or a higher proportion of nulliparous women. Therefore look at size of Group 10 (Column 4). If that is over 4-5%, this hypothesis could be true. |

* Columns number refer to Table 5.

** MCS reference population was the population of the MCS with relatively low CS rates and, at the same time, with good outcomes of labour and childbirth

For Unclassifiable cases, see recommendations in 3.d.

Table 7 (Continued): Steps to assess type of population using the Robson Classification Report Table.*

| Step | Robson guideline | Example: MCS population** | Further Interpretation |
|--|---|---------------------------|--|
| 5. Look at the size of Groups 8 (Column 4)- <i>Multiples</i> | It should be 1.5 -2% | 0.9% | If it is higher, the hospital is probably tertiary (high risk, referral) or runs a fertilization program. If lower, probably a lot of the twins are referred out especially if the remaining twins have a low caesarean section rate |
| 6. Look at the size of Groups 10 (Column 4)- <i>Preterm cephalic singletons</i> | It should be less than 5% in most normal risk settings. | 4.2% | If it is higher, the hospital is probably tertiary (high risk, referral) or there is a high risk of preterm births in the population that the hospital serves. If, in addition, the CS rate is low in this group, it could represent a preponderance of spontaneous preterm labour. If the CS rate in this group is high, it could suggest more provider initiated pre-labour CS for fetal growth restriction or pre-eclampsia and other pregnancy or medical complications. |

* Columns number refer to Table 5.

** MCS reference population was the population of the MCS with relatively low CS rates and, at the same time, with good outcomes of labour and childbirth

For Unclassifiable cases, see recommendations in 3.d.

Table 7 (Continued): Steps to assess type of population using the Robson Classification Report Table.*

| Step | Robson guideline | Example: MCS population** | Further Interpretation |
|--|-----------------------------|---------------------------|---|
| <p>7. Look at the Ratio of the size of Group 1 versus Group 2 (Divide the size of Group 1 by the size of Group 2, Column 4)</p> <p><i>Nullipara term cephalic singletons spontaneous labour /</i> <i>Nullipara term cephalic singletons Induced or pre-labour CS</i></p> | It is usually 2:1 or higher | Ratio 3.3 | <p>If it is lower, suspect poor data quality: nulliparous women who received oxytocin for augmentation (acceleration) of labour (and should be in Group 1) may have been misclassified as “induction” (and incorrectly classified as Group 2).</p> <p>If data collection is correct, a lower ratio may indicate that you have a high induction/prelabour CS issue which may indicate a high risk population in nulliparous women and are likely therefore to have a high CS rate. Additional information on pre-labour stillbirths would be the next question to ask.</p> <p>On the contrary, if the ratio is very high, you may want to look at your pre-labour stillbirth rate in this population which may indicate that you are not inducing enough. Or alternatively you may have a very low risk population</p> |

* Columns number refer to Table 5.

** MCS reference population was the population of the MCS with relatively low CS rates and, at the same time, with good outcomes of labour and childbirth

For Unclassifiable cases, see recommendations in 3.d.

Table 7 (Continued): Steps to assess type of population using the Robson Classification Report Table.*

| Step | Robson guideline | Example: MCS population** | Further Interpretation |
|--|---|---------------------------|--|
| <p>8. Look at the Ratio of the size of Group 3 versus Group 4. (Divide the size of Group 3 by the size of Group 4, Column 4): <i>Multipara without previous CS, term cephalic singletons spontaneous labour / Multipara without previous CS, term cephalic singletons induced or pre-labour CS</i></p> | <p>It is always higher than the ratio of Group 1/Group 2 in the same institution, i.e, larger than 2:1. This is very reliable finding in confirming data quality and culture of the organization.</p> | Ratio 6.3 | <p>If it is lower, suspect poor data quality: multiparous women who received oxytocin for “augmentation” of labour (and should be in Group 3) may have been misclassified as “induction” (and incorrectly classified as Group 4).</p> <p>A low ratio (due to large Group 4b) may suggest a poor previous maternal experience in vaginal delivery and a request for pre-labour CS in multiparous women. Another explanation may be pre-labour CS done to perform tubal ligation (common in settings where family planning is not easily available).</p> |
| <p>9. Look at the Ratio of the size of Group 6 versus Group 7. (Divide the size of Group 6 by the size of Group 7, Column 4) <i>Nullipara breech / Multipara breech</i></p> | <p>It is usually a 2:1 because breeches are more frequent in nulliparous women than in multiparous women.</p> | Ratio 0.8 | <p>If the ratio is different, suspect either unusual nullipara/multipara ratio or inaccurate data collection.</p> |

* Columns number refer to Table 5.

** MCS reference population was the population of the MCS with relatively low CS rates and, at the same time, with good outcomes of labour and childbirth

7.3 Steps to assess caesarean section rates

In the next page we present some suggestions on the steps to follow in order to interpret the CS rates in the Robson Report Table.

Please keep in mind the **CS rates** mentioned in the next pages **have not been validated** against outcomes and **should not be taken as a recommendation**. Merely analyzed in relation to other hospitals, CS rates in each group will vary in different hospitals and settings depending on their capacity / level

of complexity, the epidemiological characteristics of the population served and the local clinical management guidelines, among other factors.

Ultimately, the use of the classification over time will help each individual hospital or setting identify the CS rate (or range of CS rates) that is associated with the best outcomes in each of the 10 groups.



7.3 Steps to assess caesarean section rates

Table 8: Steps to assess caesarean section rates using the Robson Report Table.*

| Step | Robson guideline | MCS reference population** | Further Interpretation |
|---|--------------------------------|----------------------------|--|
| 1. Look at the CS rate for Group 1 (Column 5) | Rates under 10% are achievable | 9.8% | This rate can only be interpreted accurately when you have considered the ratio of the sizes of Groups 1 and 2. In principle, the higher the ratio of size of Groups 1:2, the higher the likelihood of both the CS rate in Group 1 and 2 being individually higher. However, the overall CS rate in Groups 1 and 2 combined may still be low or the same. |
| 2. Look at the CS rate for Group 2 (Column 5): | Consistently around 20-35% | 39.9% | CS rates in Group 2 reflect the size and rates in 2a and 2b. If size of Group 2b is large, the overall CS rates in Group 2 is also going to be large. If Group 2b is relatively small, then high rates of CS in Group 2 may indicate poor success rates for induction or poor choice of women to induce and consequently a high rate of CS in Group 2a. Remember the general principle of not interpreting one single subgroup on its own without knowing what is left out. The interpretation of group 2a requires knowing the relative sizes of Groups 1 and 2b. |

* Columns number refer to Table 5.

** MCS reference population was the population of the MCS with relatively low CS rates and, at the same time, with good outcomes of labour and childbirth

7.3 Steps to assess caesarean section rates

Table 8 (Continued): Steps to assess caesarean section rates using the Robson Report Table.*

| Step | Robson guideline | MCS reference population** | Further Interpretation |
|--|-------------------------------------|----------------------------|--|
| 3. Look at the CS rate for Group 3 (Column 5) | Normally, no higher than 3.0%. | 3.0% | In units with higher CS rates in this group, this may be due to poor data collection. It is possible that women with previous scars (Group 5) were incorrectly classified as Group 3. Other possible reasons for high rates could be for example to do tubal ligation in settings with poor access to contraception, or maternal request. |
| 4. Look at the CS rate for Group 4 (Column 5) | It rarely should be higher than 15% | 23.7% | CS rates in Group 4 reflect the size and rates in 4a and 4b. If size of Group 4b is large, the overall CS rates in Group 4 is also going to be high. If Group 4b is relatively small, then high rates of CS in Group 4 may indicate poor success rates for induction or poor choice of women to induce and consequently a high rate of CS in Group 4a. Poor data collection could also be a reason for high CS rates in Group 4; for example due to inclusion of women with previous scars in this group (when they should be in Group 5). Lastly, a high CS rate in Group 4 may reflect a high maternal request for CS even if these women have delivered their first pregnancy vaginally. This may be because of a previously traumatic or prolonged labour or to do tubal ligation in settings with poor access to contraception. |

* Columns number refer to Table 5.

** MCS reference population was the population of the MCS with relatively low CS rates and, at the same time, with good outcomes of labour and childbirth

Table 8 (Continued): Steps to assess caesarean section rates using the Robson Report Table.*

| Step | Robson guideline | MCS reference population** | Further Interpretation |
|--|---|--|---|
| 5. Look at the CS rate for Group 5 (Column 5) | Rates of 50-60% are considered appropriate provided you have good maternal and perinatal outcome. | 74.4% | If rates are higher, this is possibly due to a large Group 5.2 (women with 2 or more previous CS). This could also be due to a policy of scheduling pre-labour CS for all women with 1 previous scar without attempting a trial of labour. |
| 6. Look at the CS rate for Group 8 (Column 5) | It is usually around 60%. | 57.7% | Variations will depend on the type of twin pregnancy and the ratio of nulliparous/multiparous with or without a previous scar. |
| 7. Look at the CS rate in Group 10 (Column 5): | In most populations it is usually around 30% | 25.1% | If higher than 30%, it is usually due to many cases of high risk pregnancies (e.g. fetal growth restriction, preeclampsia) that will need preterm pre-labour CS. If lower than 30%, it suggests a relatively higher rate of preterm spontaneous labour and hence a lower overall CS rate. |
| 8. Look at the relative contribution of Groups 1, 2 and 5 to the overall CS rate (add the contribution of each of these groups in Column 7) | These three groups combined normally contribute to 2/3 (66%) of all CS performed in most hospitals. | These three groups combined contributed to 63.7% of all CS | These three groups should be the focus of attention if the hospital is trying to lower the overall CS rate. The higher the overall CS rate, the greater the focus should be in Group 1. |
| 9. Look at the absolute contribution of Group 5 to the overall CS rate (Column 7) | | This group was responsible for 28.9% of all CS | If it is very high, this may indicate that in previous years, CS rates in Groups 1 and 2 have been high and it is worth exploring further. |

* Columns number refer to Table 5.

** MCS reference population was the population of the MCS with relatively low CS rates and, at the same time, with good outcomes of labour and childbirth

08. Barriers and facilitators to implement the classification

“DESIGNATE A PERSON TO BE IN CHARGE OF ORGANIZING DATA COLLECTION”

The first step in implementing the classification is to designate a person if possible (clinician, nurse, clerk, manager or other) to be in charge of organizing data collection and producing the Robson Report Tables at weekly or monthly intervals.

This person can then work with the staff in the labour and delivery wards and coordinate efforts to ensure that all newly admitted patients have all the necessary obstetric variables collected in their record, to allow their classification into one of the 10 Robson groups.

According to users, the main strengths of the classification are its simplicity, robustness, reliability and flexibility. However, missing data, misclassification of women and lack of definition or consensus on core variables of the classification may cause problems (11).



The Robson Classification is not free of challenges and difficulties. The main difficulties pointed by users were:

Lack of definition or consensus on the core variables used in the classification: For example, it is necessary to reach an agreement on when labour starts and how to clarify the difference between augmentation (acceleration) versus induction of labour. We therefore recommend that each hospital creates a clear written definition (a glossary) of the variables that may vary in different settings (such as spontaneous onset of labour or induction) and add these definitions as a footnote of the Robson Report Table (see Table 5).

Quality of the data used to classify women: If the data used is unreliable, the real value of recommendations based on the classification is questionable.

Ensuring good quality of the data should not be taken for granted and it can be challenging even in high-resource settings.

Misclassification of women in wrong groups: This is a real possibility however you collect your data. In all settings, data collectors need to be carefully trained and audited periodically, for example by another person reviewing and re-classifying a sample of records from women in each of the 10 groups. By looking carefully at the Report Table and following the interpretation rules, users can find important clues about possible misclassification of specific groups.

Cases that cannot be classified due to missing data: The size of “Unclassifiable” category is an important indicator of the quality of the data in the individual patient records.

The lack of validation of the interpretation rules: A simple set of rules for interpretation was provided by Robson (14) to help users explore all the information provided by this classification, especially when using it to compare data between different settings or changes over time. However, these rules still need to be validated to ensure that the figures proposed (especially regarding expected CS rates per groups) are associated with good maternal and perinatal outcomes. We strongly encourage users of the classification to collect their own data on maternal as well as perinatal morbidity and mortality per Robson group and analyze these data regularly.

09. References



09. References

1. Betrán AP, Ye J, Moller AB, Zhang J, Gülmezoglu AM, Torloni MR. *The increasing trend in caesarean section rates: Global, regional and national estimates: 1990-2014*. PLoS ONE. 2016;11(2):e0148343.
2. Vogel JP, Betrán AP, Vindevoghel N, Souza JP, Torloni MR, Zhang J, et al. *Use of the Robson Classification to assess caesarean section trends in 21 countries: A secondary analysis of two WHO multicountry surveys*. The Lancet Global Health. 2015;3(5):e260-e70.
3. WHO Statement on Caesarean Section Rates. Geneva: World Health Organization; 2015 (WHO/RHR/15.02).
4. Betrán AP, Torloni MR, Zhang J, Ye J, Mikolajczyk R, Deneux-Tharaux C, et al. *What is the optimal rate of caesarean section at population level? A systematic review of ecologic studies*. Reproductive Health. 2015;12:57.
5. Lumbiganon P, Laopaiboon M, Gülmezoglu AM, Souza JP, Taneepanichskul S, Ruyan P, et al. *Method of delivery and pregnancy outcomes in Asia: the WHO global survey on maternal and perinatal health 2007-08*. Lancet. 2010;375:490-9.
6. Souza JP, Gülmezoglu A, Lumbiganon P, Laopaiboon M, Carroli G, Fawole B, et al. *Caesarean section without medical indications is associated with an increased risk of adverse short-term maternal outcomes: the 2004-2008 WHO Global Survey on Maternal and Perinatal Health*. BMC medicine. 2010;8:71.
7. Gibbons L, Belizan JM, Lauer JA, Betran AP, Merialdi M, Althabe F. *Inequities in the use of cesarean section deliveries in the world*. Am J Obstet Gynecol. 2012;206(4):331 e1-19.
8. Betrán AP, Torloni MR, Zhang J, Gülmezoglu AM, for the WHO Working Group on Caesarean Section. *Commentary: WHO Statement on caesarean section rates*. BJOG. 2016;123(5):667-70.
9. Robson MS. *Classification of caesarean sections*. Fetal and Maternal Medicine Review. 2001;12(1):23-39.
10. Torloni MR, Betran AP, Souza JP, Widmer M, Allen T, Gülmezoglu M, et al. *Classifications for cesarean section: a systematic review*. PLoS ONE. 2011;6(1):e14566.
11. Betrán AP, Vindevoghel N, Souza JP, Gülmezoglu AM, Torloni MR. *A Systematic review of the Robson Classification for caesarean section: What works, doesn't work and how to improve it*. PLoS ONE. 2014;9(6).
12. Robson M, Murphy M, Byrne F. *Quality assurance: The 10-Group Classification System (Robson classification), induction of labor, and cesarean delivery*. International Journal of Gynecology and Obstetrics. 2015;131:S23–S27.
13. FIGO Working Group on Challenges in Care of Mothers and Infants during Labour and Delivery. *Best practice advice on the 10-Group Classification System for cesarean deliveries*. International Journal of Gynaecology and Obstetrics. 2016;135(2):232-3.
14. Robson M, Hartigan L, Murphy M. *Methods of achieving and maintaining an appropriate caesarean section rate*. Best Pract Res Clin Obstet Gynaecol. 2013;27:297-308.
15. Robson MS. *Can we reduce the caesarean section rate?* Best Pract Res Clin Obstet Gynaecol. 2001;15(1):179-94.
16. Souza JP, Betrán AP, Dumont A, de Muncio B, Gibbs Pickens C, Deneux-Tharaux C, et al. *A global reference for caesarean section rates (C-Model): a multicountry cross-sectional study*. BJOG 2016;123:427–436.
17. Souza JP, Gülmezoglu AM, Vogel J, Carroli G, Lumbiganon P, Qureshi Z, et al. *Moving beyond essential interventions for reduction of maternal mortality (the WHO Multicountry Survey on Maternal and Newborn Health): a cross-sectional study*. Lancet. 2013;18(38):1747-55.
18. Souza JP, Gülmezoglu AM, Carroli G, Lumbiganon P, Qureshi Z, WHOMCS Research Group. *The World Health Organization multicountry survey on maternal and newborn health: study protocol*. BMC Health Serv Res. 2011;11:286.
19. Robson M. *A global reference for CS at health facilities? Yes, but there is work to do*. BJOG. 2016;123(3):437.

