

# The growing use of the WHO Safe Childbirth Checklist: Lessons learned at the Yaounde Gyneco-Obstetric and Pediatric Hospital, Cameroon

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## Research article

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# Abstract

**Background:** Safe childbirth remains a daunting challenge, particularly in low-resource settings where most pregnancy-related deaths occur. Cameroon's maternal mortality rate, estimated at 782 per 100,000 live births in 2011 is significantly high. Adherence to good practice standards by birth attendants is key to improving pregnancy outcomes. The WHO Safe Childbirth checklist was designed as a tool to improve the quality of care provided to women giving birth. This checklist was implemented at the Yaounde Gyneco-Obstetric and Pediatric Hospital. Quantitative and qualitative assessment of its utilization is essential to secure a change in attitudes and practice and determine improvement in maternal health.

**Objective:** Evaluate a change in attitudes and practice and determine improvement in outcomes 6 months after initiation of the safe childbirth checklist use.

**Methods:** A cross sectional and retrospective study was conducted over a 6 month period (January – June 2018). Predesigned questionnaires were used to collect qualitative data from personnel of the Gynecology and Obstetrics unit and quantitative data from patient delivery records. Data analysis was done using SPSS version 23.0. Chi square test was used to compare categorical variables, while the student test was used to compare continuous variables. P -values below 5% were considered statistically significant.

**Results:** Of the 1001 files retrieved from the archives, 25 were excluded. The checklist was used in 828/976 (84.8%) files. We observed an increasing trend in the usage rate, with a peak at 93.9% during the last 2 months. Pages 2 and 3 were least completed, in <10% of cases during the first 5 months. A significant reduction in the onset of pre-eclampsia and eclampsia was noted with the use of the checklist (2.1% Vs 5.4%,  $p = 0.017$ ). The proportion of neonatal deaths recorded amongst cases with a used checklist was smaller compared to cases without checklists (0.2% Vs 0.7%,  $p = 0.380$ ). Fifty percent of the staff reported that the checklist increased workload while 37.5% mentioned laziness and absence of checklists in some files as a hindrance to its proper use.

**Conclusion:** The use of the checklist improved progressively with a simultaneous reduction in obstetrical and neonatal complications.

## Background

Childbirth is a moment of overwhelming expectation and anxiety for the family as a whole and the couple in particular. The World Health Organization estimates more than 130 million births occur every year worldwide [1]. In 2015, about 303,000 women died from preventable causes related to pregnancy and childbirth. Safe childbirth remains a daunting task, particularly in low-resource settings where most pregnancy-related deaths occur. Cameroon's maternal mortality rate, estimated at 782 per 100,000 live births in 2011 is unacceptably high [2]. The majority of these complications and deaths are preventable. Therefore, skilled healthcare before, during and after child birth is vital [3].

Several strategies have therefore been put in place to improve the quality of care and reduce the mortality of women giving birth. Those strategies are: Emergency Obstetric and Neonatal Care, family planning and skilled attendance at childbirth [4, 5]. In view of the complex nature of childbirth, useful tools have been developed to ensure the mother and newborn receive skillful and the safe care. These tools include: case notes, the partograph and the checklist [6]. The checklist is a structured 28-item recall tool of scientifically-proven delivery practices, which targets the prime causes of maternal deaths, intrapartum-related stillbirths and neonatal deaths in health facilities worldwide[7].

The WHO Safe Childbirth Checklist is intended for use at four pause points during facility-based births, to help health workers ensure that essential birth practices are performed at critical moments for every delivery. These pause points enable midwives to concentrate on protecting the mother and newborn against dangerous complications.

Maternal and neonatal mortality rates are key indicators of the health system's strength [8]. The institution of strategies to prevent and manage pregnancy-related complications is a necessity for every health facility. The checklist is a tool which was recently implemented in the Gynecology and Obstetrics unit of the Yaoundé Gyneco-Obstetric and Pediatric Hospital to improve the quality of health care. Therefore, it was appropriate to carry out a qualitative and quantitative assessment of the use of the WHO Safe Childbirth checklist in this unit since its implementation.

- Main Objective

Our main objective was to evaluate the level of use of the checklist at the Gynecology and Obstetrics Department of the Yaoundé Gyneco-Obstetrics and Pediatrics Hospital (YGOPH) and identify the benefits provided to the staff and parturients.

- Specific Objectives

More specifically, we sought to evaluate the rate of use of the checklist, to determine the Completion rates of the checklist, to do a monthly comparative analysis since its implementation and to determine the factors influencing the non-utilization of the checklist.

## **Materials And Methods**

### **Study design, site and duration**

We carried out a cross sectional and retrospective study at the maternity unit of the Gyneco-Obstetric and Pediatric Hospital, Yaoundé-Cameroon (YGOPH). Data of deliveries conducted from January 2018 to June 2018 was collected over a period of one month (July 2018).

### **Participants and data collection**

# Inclusion criteria

- For the qualitative analysis: Staff of the Gynecology and Obstetrics department of the YGOPH who had received training on the childbirth checklist
- For the quantitative analysis: All delivery records within the study period (from the implementation of the checklist to June 2019) at the YGOPH were targeted for this study.

# Exclusion criteria

- Incomplete files (files without the delivery route mentioned)
- Files of women referred to YGOPH in post partum
- Files of women referred to other institutions for delivery from YGOPH
- Case reports of women managed for pathologies in pregnancy without ensuing delivery at YGOPH

# Variables and data sources

After obtaining administrative authorization and approval of the research proposal, we submitted a questionnaire to the staff of the gynecology and obstetrics department on the use of the WHO checklist and we proceeded to retrieve the delivery records of all parturients. The study took place in several steps.

The first step was to use a predesigned data collection sheet to collect the following data from:

# Parturient files

- Identification: name, age, place of residence
- Past history: obstetric, surgical, medical
- Completion rate of the checklist for each parturient and newborn
- Files with checklists and without checklists
- Obstetric and neonatal complications

After which information was collected from the staff using a questionnaire,

# From the staff

- Identification: name, age, sex, rank, work experience, position held
- Questions related to knowledge of the checklist
- Questions on the utilization of the checklist at the service

# Statistical analysis

This was done using the SPSS version 23.0 software. The association between qualitative variables expressed in frequencies and percentages was investigated using the Chi square or Fisher test. The student test and Mann Whitney tests were used to investigate the association between quantitative variables expressed in means and median. The significance threshold was set at 0.05.

## Ethical considerations

After obtaining administrative authorization and approval of the research protocol, we began the study in respect of ethical principles. Data collection was done with strict respect of the principle of confidentiality. The rationale of the study was clearly explained to every staff with consent obtained. The identity of every participant was concealed through consecutive numbering.

## Results

Amongst the 1001 files retrieved from the archives, 976 were retained. Twenty-five were excluded: seven abortions, nine admitted for treatment of pregnancy-related pathologies and nine were either referred to other facilities or sent home after counseling on danger and labour signs. The checklist was used in 828 files during the study period giving a usage rate of 84.8%. We observed that the highest proportion of files without filled checklists were those of women who gave birth in January and February. However, an increasing trend in the usage rate was noted, with a peak at 93.9% recorded during the months of May and June. (See Table 1)

The mean age of our study population was  $28 \pm 6$  years with a range of 15 to 44 years. The most represented age group was 25–29 years. (See Figure 1) Majority of our population was paucipara. (See Table 2) Three peripartum pathologies were common in the medical history of parturients: hypertension, gestational diabetes and postpartum hemorrhage. The most frequent was hypertension. (See Table 3) Caesarean sections were the most frequent prior surgical procedures performed on parturients as shown in figure 2. The proportion of caesarean delivery files with unfilled checklists was greater than vaginal delivery files with unfilled checklists. (See Table 4)

The completion rate for different pages of the checklist increased with time. This increasing tendency was most remarkable from the 5<sup>th</sup> to the 6<sup>th</sup> month for pages 2 and 3. Completion rate of pages 2 and 3 was low from the 1<sup>st</sup> to the 5<sup>th</sup> months (consistently below 10%). Conversely, pages 1 and 4 of the checklist had a major role to play in the increasing trend of the overall completion rate during the first five months, with values surging above 60%. (See Figure 4)

Obstetric complications were similar in both groups. (15.3% Vs 14.9%,  $p = 0.883$ ) (See Table 5) Further analysis revealed that fewer obstetric complications occurred in the group with checklists compared to

those without during the last 2 months (6·9% Vs 9·5%). (See Figure 5) A significant reduction in the onset of pre-eclampsia and eclampsia was noted with the use of the checklist (2·1% Vs 5·4%,  $p = 0·017$ ). The proportion of neonatal deaths recorded amongst cases with a used checklist was smaller compared to cases without checklists (0·2% Vs 0·7%,  $p = 0·380$ ). (See Figure 6)

The maternity staff responsible for using the checklist was made up of 19 persons. Ten qualitative assessment data collection sheets were distributed to them. Two out of 10 were not properly filled, so eight were retained and analyzed. Knowledge about the use of the checklist was graded as moderate. Three out of eight (3/8) staff reported that they still needed to learn on job after the training session on how to use the checklists. (See Table 7) Approximately half of the maternity team found completing the checklist to be too much workload. Another 50% reported that the checklist improved the organization of work, the orientation of patients and the quality of care offered. While 75% of the team felt that health care quality improved after the implementation of the checklist, 25% (2/8) complained that they observed no improvement.

## Discussion

We found that introducing the World Health Organization Safe Childbirth Checklist (WHO SCC) using the engage-launch-support strategy was a rewarding task. This resulted in improved adherence to essential birth practices (EBP) and decreased neonatal and obstetrical complications with time. The engage phase involved the education of service providers on the checklist during a regular staff meeting, providing them with copies of the checklist and instructing them to incorporate it in their routine practice. Very few adaptations were made to the checklist to suit our local context at this time. The duration of premature rupture of membranes which is one of the conditions to start maternal antibiotics was modified from greater than 18 hours was changed to less than 6 hours on page 1 of the checklist. No formal practical training session was organized. The health care providers learned by applying what they were taught on the job and supporting each other.

The official launching of the WHO SCC was done at a seminar organized in the month of March 2018. Implementation outcomes included the level of knowledge, the usage rate of the WHO SCC and the health of mothers and newborns. The overall adoption rate was (828/976 files; 84·8%). This is about double the rate recorded in a tertiary care setting in Sri Lanka during a prospective observational study, but similar to findings in Namibia, a Sub Saharan African country [9,10]. The pages with the following childbirth practices were checked least often: confirming if mother needed to start antibiotics or antihypertensive treatment during labor or after delivery, seeking an assistant during labor, checking the availability of mother and baby's essential delivery supplies, abnormal bleeding control after birth, early breastfeeding, baby's referral, special care, monitoring and the newborn's need for antibiotics.

Fifty percent of the service providers complained that the checklist increased their workload and 25% the non-availability of checklists in patient files. The former reflects a problem with either their attitude or the level of knowledge on the checklist while the latter could be handled by systematically pinning a checklist

to every nursing file. The inclusion of the use of the checklist in their work package without any practical training for easy use tips could be the reason. This explains the suboptimal utilization of the checklist. These findings are different from those reported by Perry *et al.* who reported that end users of the checklist in a global collaboration were extremely willing to use the checklist when first introduced [11]. Most service providers (67.5%) defined the WHO SCC as “*a control, monitoring and recall tool which serves as a reminder for actions to take at each step of patient care*”. The challenge therefore is to work on attitudes of providers and to improve the practice of Childbirth checklists through refresher training sessions and supervision by nurses who are more skilled in using the checklist.

Evidence on the effectiveness of the implementation was seen in declines in obstetrical and neonatal complications over time. Rates of neonatal complications dropped during the 6 months of the intervention. Checklists were incorporated into patient files. Obstetrical complications rose during the first four months from 7.2% to 20.7% and then dropped to 6.9% during the last two months amongst cases with filled checklists. The poor utilization and completion of the checklist during the first 2 months may have contributed this.

## Study limitations

Since the study was retrospective, we had no influence on the quality of data entered into the delivery records. However; measure taken to minimize this limitation was comparison with data in delivery registers and service reports. Furthermore, this study was only carried out in one facility because it was a pilot research work. From the positive results obtained and presented to the personnel, we intend to get other health facilities to implement this recall tool.

## Conclusion

Increasing utilization of the checklist was confirmed and obstetrical/ neonatal complications significantly reduced overtime. The latter indicates the use of the childbirth checklist as an indicator of quality performance in maternal and reproductive health.

## List Of Abbreviations

*EBP*: Essential Birth Practices, *HGOPY/YGOPH*: Yaounde Gyneco-Obstetric and Pediatric Hospital, *SCC*: Safe Childbirth Checklist, *WHO*: World Health Organization

## Declarations

## Ethical considerations

Ethical approval was obtained from the Institutional Review Board of the Yaounde Gyneco-Obstetric and Pediatric Hospital. Data collection was done with strict respect of the principle of confidentiality. The rationale of the study was clearly explained to every staff with consent obtained. The identity of every participant was concealed through consecutive numbering.

## Consent for publication

Not applicable.

## Availability of data and materials

The datasets generated and/or analyzed during the current study are available from the corresponding author on request.

## Competing interests

The authors declare that they have no competing interests.

## Funding

None

## Authors' contributions

*SJD*: introduction of the checklist at the YGOPH, manuscript revision, director and correction of work, *NIEW*: data interpretation, write up of first manuscript, literature search, *CHK*: study design, data collection, *WT*: data analysis, manuscript revision *PF*: director of the intervention and research work, manuscript revision *BAL*: data analysis, manuscript revision, *RNO*: research conception, introduction of the checklist at the YGOPH, manuscript revision, *AIIFF*: research conception, supervisor of the research work, final corrections of the manuscript

All authors read and approved the final manuscript.

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## Tables

Table 1: Frequency and proportion of the utilization of the checklist

Month	Groups		Proportion	Total
	check-list use	No checklist		
January	110	53	67.5	163
February	162	48	77.1	210
March	122	13	90.4	135
April	113	13	89.7	126
May	130	8	94.2	138
June	191	13	93.6	204
Total	828	148	84.8	976

**Table 2:** Prevalence of different parity and gravidity groups

	Frequency (n)	Percentage (%)
<b>Parity</b>		
1-2	520	53.3
3-4	217	22.2
≥ 5	81	8.3
Unknown	158	16.2
Total	976	100.0
<b>Gravidity</b>		
1-2	442	45.3
3-4	289	29.6
≥ 5	245	25.1
Total	976	100.0

**Table 3:** Prevalence of peripartum pathologies

Pathology	Frequency (n)	Percentage (%)
Hypertensive disorders	34	3.5
Gestational diabetes	2	0.2
PPH	3	0.3
None	937	96.0
Total	976	100.0

**Table 4:** Impact of the checklist on the choice of delivery route

Mode of delivery	G1* (N1=828)	G2* (N2=148)	Total	P-value*
Vaginal delivery	699 (84.4%)	108 (73.0%)	807 (82.7%)	0.001
Cesaerean section	129 (15.6%)	40 (27.0%)	169 (17.3%)	
Total	828 (100.0%)	148 (100.0%)	976 (100.0%)	

G1: group with checklist used; G2: group with no checklist used; P: P-value

Table 5: Impact of the checklist on the prevention of obstetric complications

Obstetric complications	G1 (N1=828)	G2 (N2=148)	Total	P-Value
Yes	127 (15.3%)	22 (14.9%)	149 (15.3%)	
No	701 (84.7%)	126 (85.1%)	827 (84.7%)	0.883
Total	828 (100.0%)	148 (100.0%)	976 (100.0%)	

G1: group with checklist used; G2: group with no checklist used; P: P-value

Table 6: Impact of the checklist on the prevention of pre-eclampsia/eclampsia

Eclampsia/Pre-eclampsia	G1* (N1=828)	G2* (N2=148)	Total	P
Yes	17 (2.1%)	8 (5.4%)	25 (2.6%)	0.017
No	811 (97.1%)	140 (94.6%)	951 (97.4%)	
Total	828 (100.0%)	148 (100.0%)	976 (100.0%)	

G1: group with checklist used; G2: group with no checklist used; P: P-value

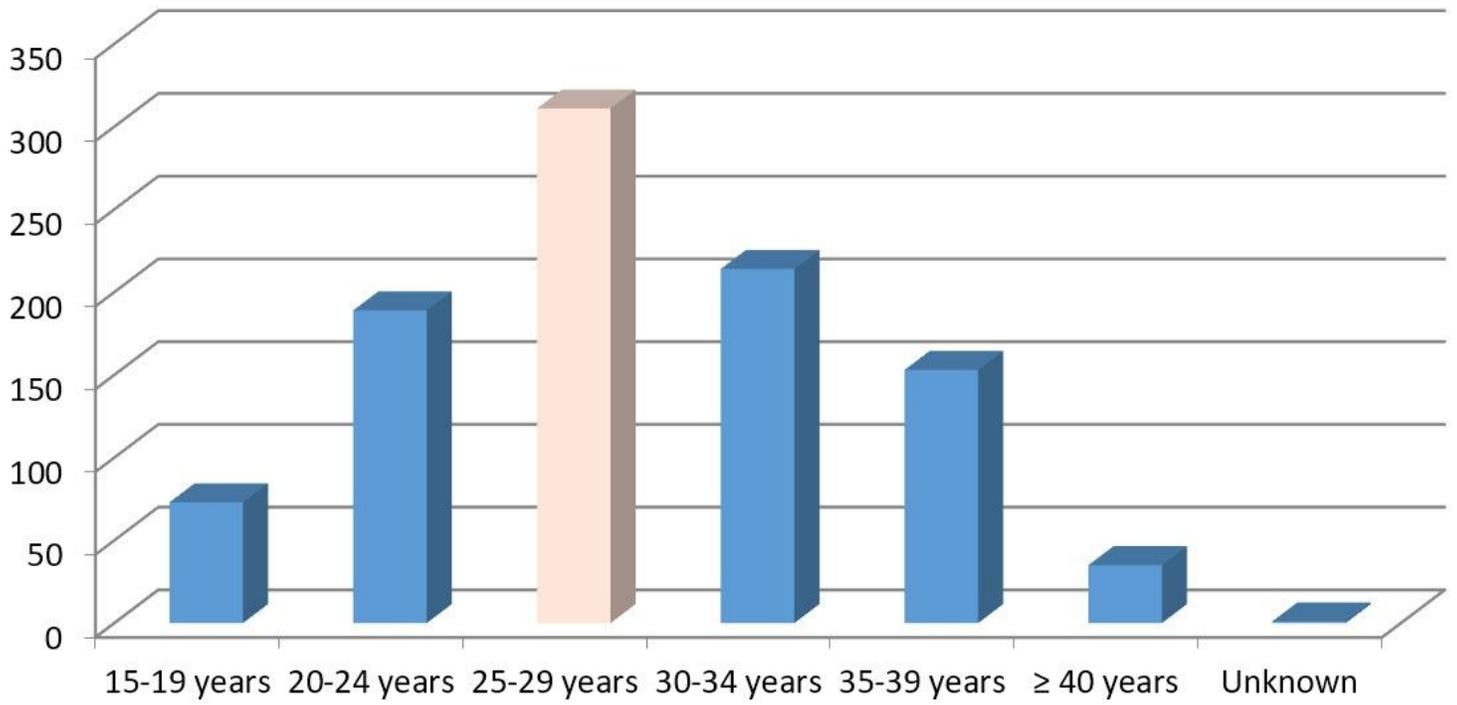
Table 7: Assessment of knowledge, attitudes and practice of maternity staff with regards to the checklist

Variable	Frequency (n)	Percentage (%)
1. What is the WHO Safe Childbirth Checklist?		
A control, monitoring and recall tool	5	62.5
A security tool	2	25.0
A tool for cooperation between units	1	12.5
A protocol	1	12.5
2. What do you know about the checklist?		
Gives information about the patient	6	75.0
Serves as a reminder for actions to take at each step of health care	5	62.5
States the management procedure	2	25.0
Identifies risks for complications	1	12.5
3. How did you learn how to use the checklist?		
During the education session on the purpose and use of the checklist	7	87.5
While using in the wards	3	37.5
4. What were your first impressions?		
Satisfied with its implementation	3	37.5
Good	1	12.5
Too much work load	4	50.0
5. Talk about the use of the checklist		
Begins upon arrival of the patient, helps to evaluate the patient's state	3	37.5
Used to assess women during labour and define their management	2	25.0
Used upon arrival of patient, during labour and after delivery	3	37.5
Used to prevent the onset of complications during childbirth	1	12.5
6. How does it help you?		
In the organization of work, orientation and care	4	50.0
Helps prevent complications	3	37.5
Quick assessment of patient	1	12.5
To follow-up patient	1	12.5
7. Suggestions		
Create a cesarean section checklist	2	25.0
Make the checklist anonymous	1	12.5
Assessment upon discharge should be effective	1	12.5
Explain how it is used	1	12.5
8. Comparison of work quality: Before implementation of the checklist		
Poor identification of patient	2	25.0
Poor knowledge of patient's state	1	12.5
Unprecised diagnosis	1	12.5
Poor care	3	37.5
More complications recorded	1	12.5
Work done right	1	12.5

- After implementation of the checklist		
No improvement	2	25.0
Quick reminder of care procedure	2	25.0
Knowledge of the patient improved	2	25.0
Promotes team spirit	2	25.0
Enables to better prevent complications	2	25.0
9. On which patients should the checklist be used?		
All patients	6	75.0
Only pregnant women	1	12.5
Patients referred and admitted as emergencies	1	12.5
10. When should the checklist be used		
Upon arrival of patient, during delivery, after delivery and upon discharge	3	37.5
At every step of delivery only	2	25.0
On no occasion	1	12.5
During the patient's transfer	2	25.0
11. How to use the checklist		
Identify the patient and the referral reason	2	25.0
Identify the patient and transfer to the next step of the care chain	4	50.0
Do nothing	1	12.5
Upon patient's arrival and during hospital stay	1	12.5
What can prevent the use of the checklist?		
Attitude	2	25.0
Absence of checklist in the file		
Laziness	1	12.5
Nothing	3	37.5

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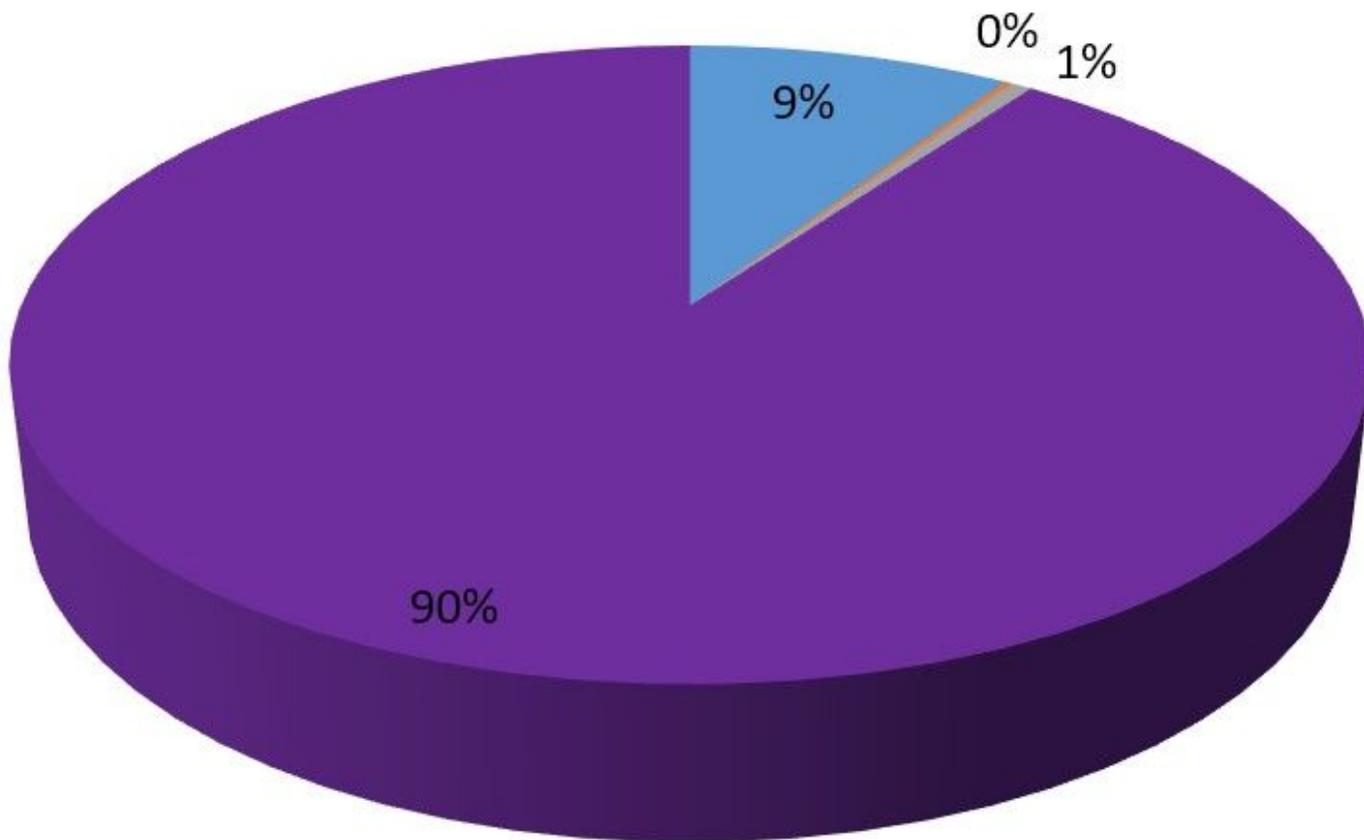
## Figures



**Figure 1**

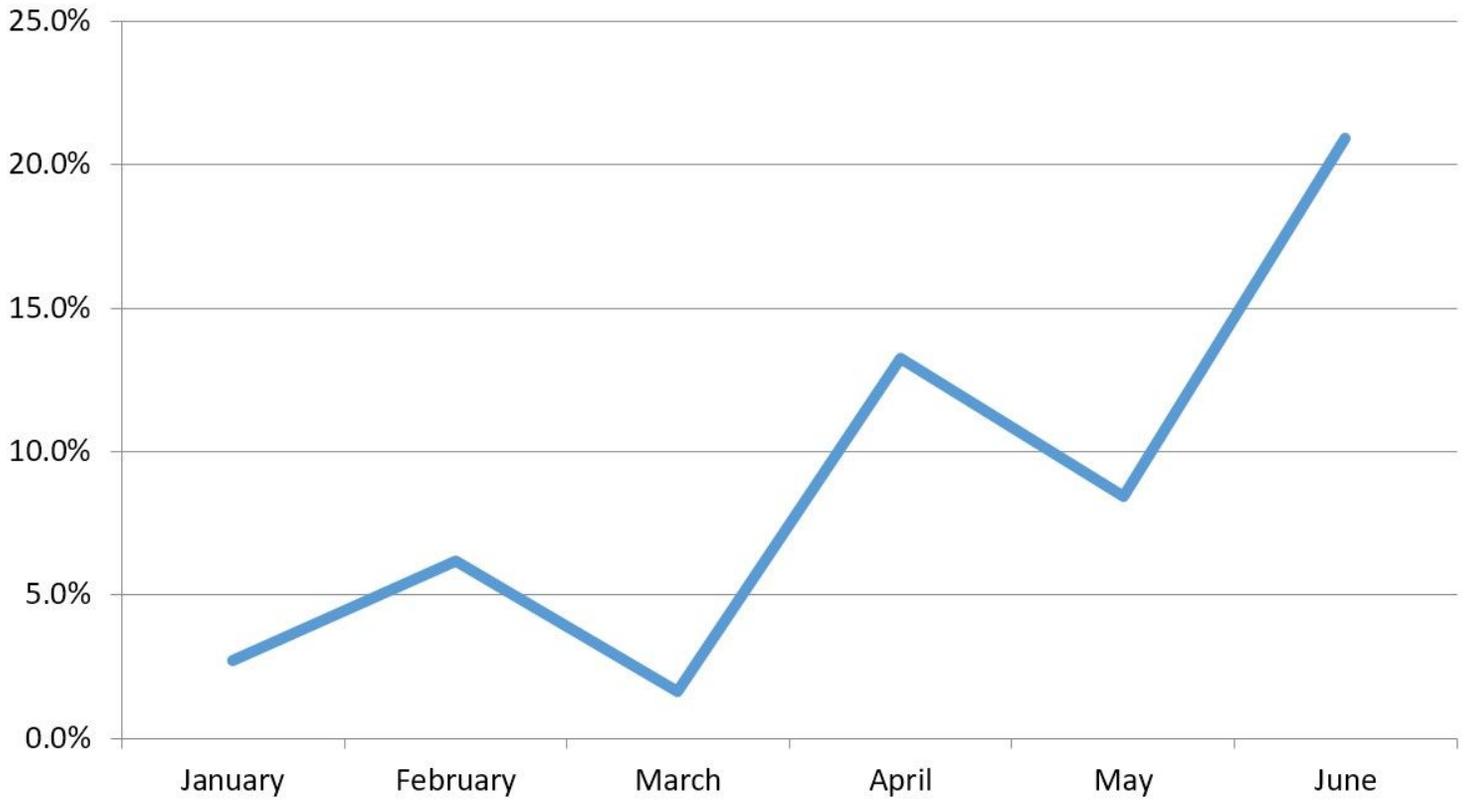
Prevalence of different age groups in study population

■ Cesaerean section   ■ Myomectomy   ■ Others   ■ None



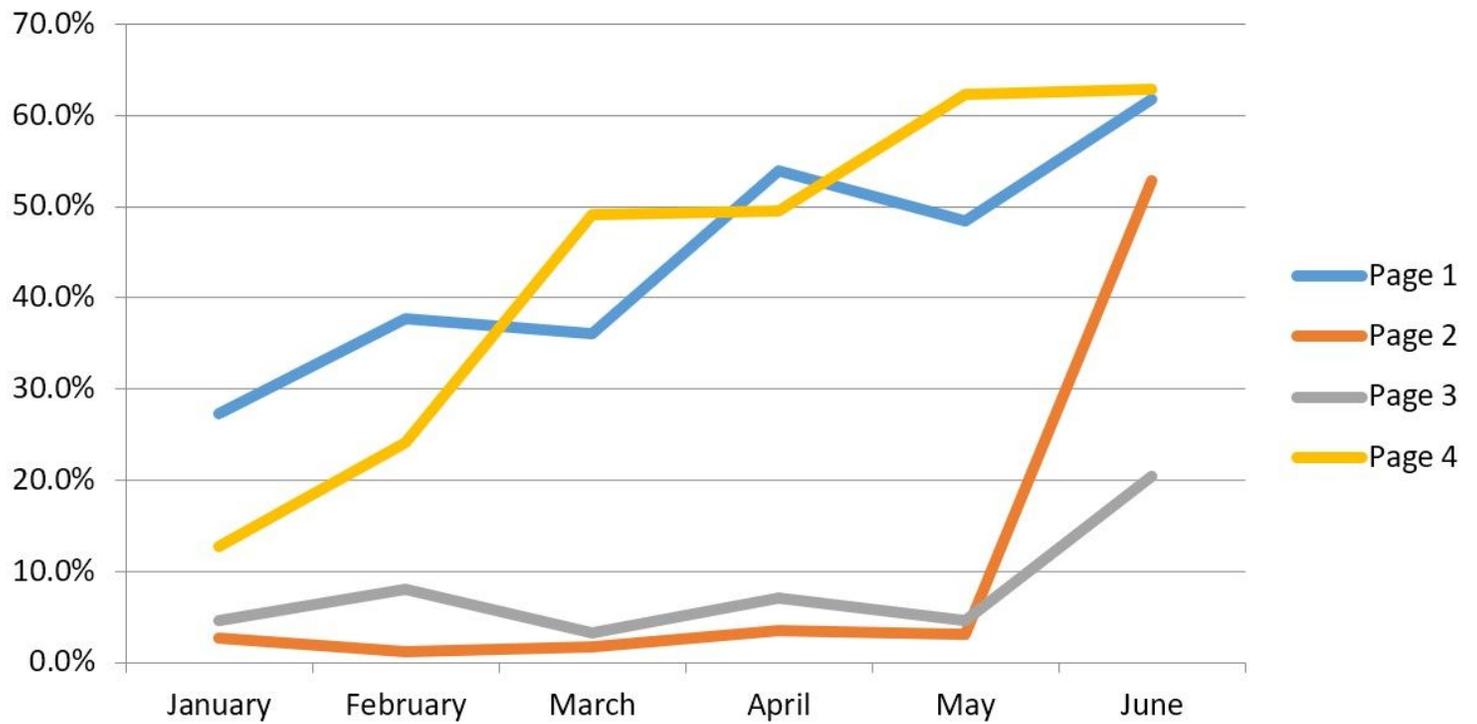
**Figure 2**

Past surgical history



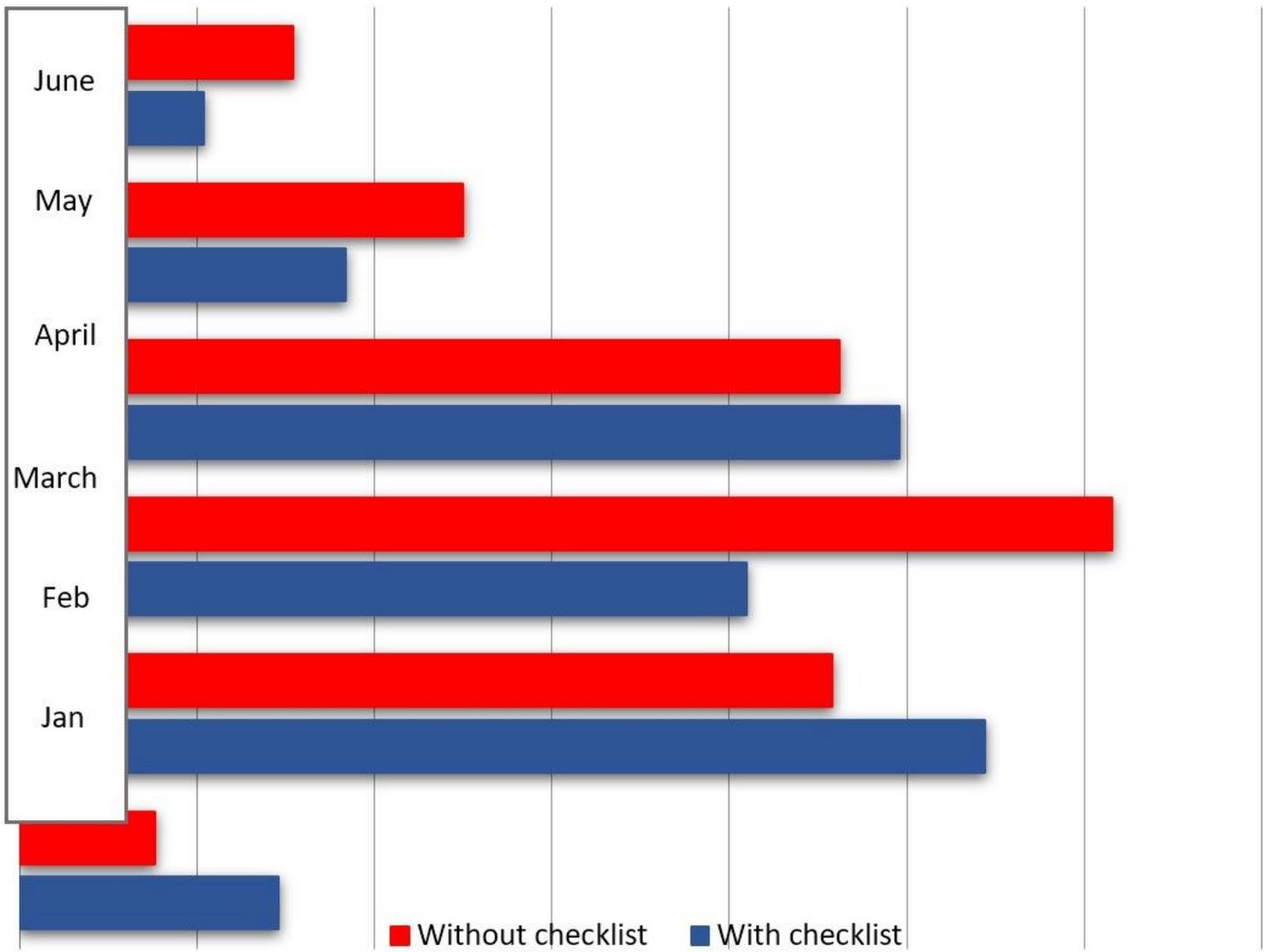
**Figure 3**

Evolution of the completion rate of the checklist over time



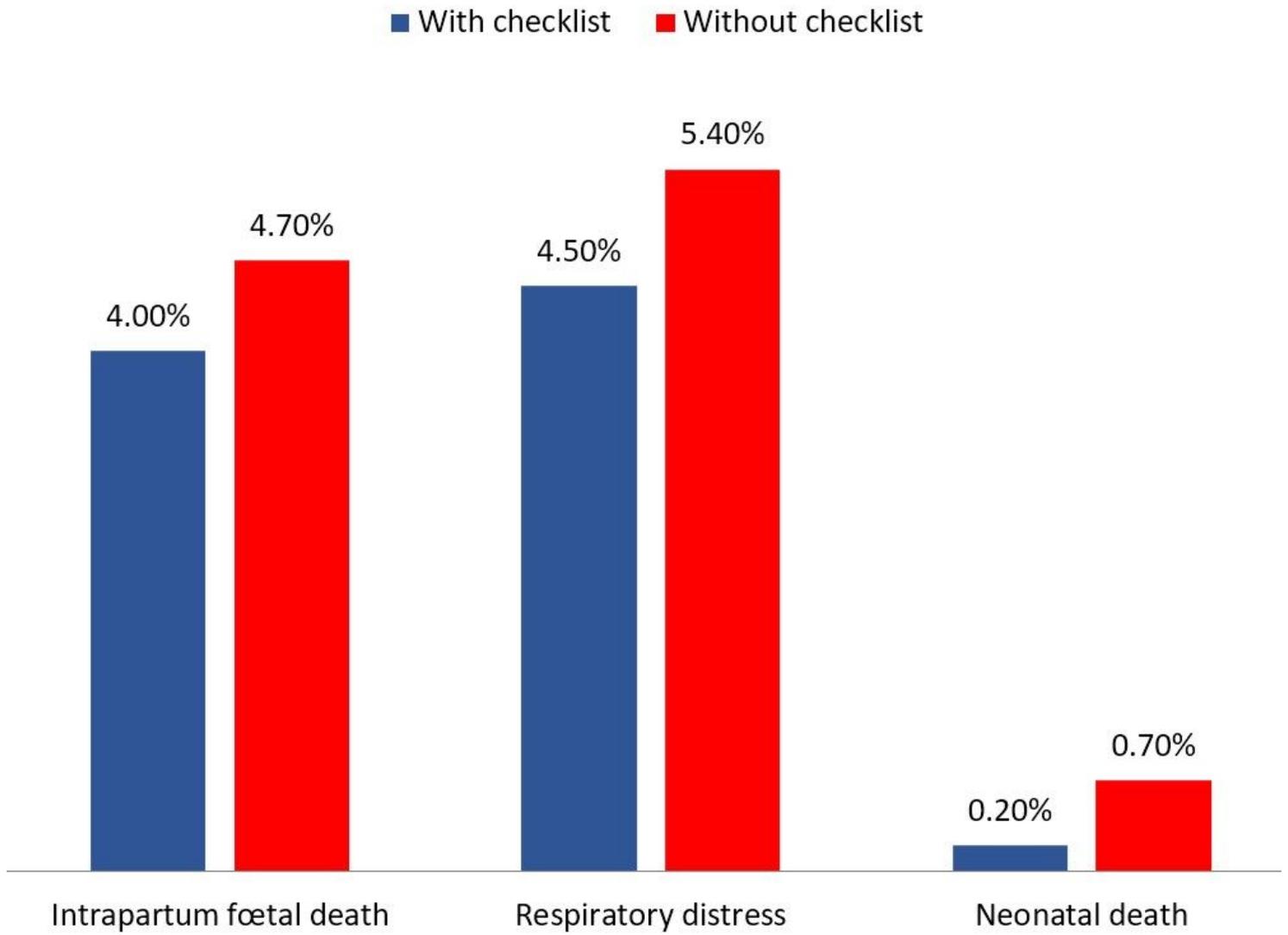
**Figure 4**

Evolution of completion rate per page of the checklist



**Figure 5**

Evolution of obstetrical complications per month



**Figure 6**

Impact of the checklist on neonatal complications