

# The Use of Ferric Carboxymaltose for Pregnant and Postpartum Women in Brazil: Estimation of Target Population and Budget Impact Analysis from the Public Health Care System Perspective

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## INTRODUCTION

- Iron deficiency is strongly associated with maternal and perinatal mortality. The risk of maternal mortality is 2.4 times (95% confidence interval - CI: 1.60-3.48) higher in women with severe anemia compared to women without severe anemia. There is a 2 to 3-fold increase in the perinatal mortality rate when hemoglobin (Hb) levels fall below 8.0 g/dl, and an 8 to 16-fold increase when maternal hemoglobin levels fall below 5.0 g/dl<sup>1</sup>.
- In Brazil, the prevalence of iron deficiency anemia in pregnant women is not well defined. However, in 2019 the World Health Organization (WHO) estimated a prevalence of 19.1% or around 342,400 pregnant women in Brazil<sup>2</sup>. According to Seid *et al* (2017), up to 40% of patients on oral iron therapy report gastrointestinal adverse events<sup>3</sup>.
- Macedo *et al.* (2020) assessed the prevalence of postpartum anemia and associated factors in a tertiary maternity hospital. The prevalence of postpartum anemia found in the maternity hospital was 27.27%<sup>4</sup>.

## OBJECTIVE

- From the Brazilian public health care system (SUS) perspective this study aims to estimate the potential number of eligible patients with iron deficiency anemia (IDA) and the budgetary impact analysis (BIA) of introducing Ferric Carboxymaltose (FCM) for pregnant and postpartum women (PPW).

## METHODS

- A descriptive study was carried out with data obtained from the Brazilian Institute of Geography and Statistics (IBGE) and from the SUS platform, which were analyzed and statistically compared to estimate the target Brazilian population of pregnant and PPW over 5 years.
- In order to perform the BIA, research of epidemiological data was carried out focusing on women population growth (IBGE) plus the number of deliveries in the SUS platform. First, We calculated the number of second and third trimester pregnant women, which is the number of SUS deliveries divided by 1.5. (Table 1).
- To calculate the number of IDA pregnant women, the prevalence was 19.1%, intolerance to oral iron salts was 40% and postpartum IDA was 27.27%. The population of pregnant women and PPW intolerant to iron salts were considered in the BIA. (Table 1). (Figure 1 and 2)
- The costs per treatment for pregnant women were: FCM (BRL 947.56); LD-IV iron (BRL 918.00); While for PPW were: FCM (BRL 1,421.34); LD-IV iron (BRL 1,836.00).
- A BI analysis was performed considering different scenarios of increased utilization rates of FCM versus low-dose intravenous (LD-IV) iron (10%, 30%, 50%, 60% and 80%) for both pregnant and postpartum target populations. The time horizon was 5 years, from 2023 to 2027. (Table 1 & 2).

## RESULTS

- We estimated a total of 156,413 eligible patients with IDA, amongst them 91,263 pregnant women and 65,150 PPW intolerant to oral iron. (Table 1) (Figure 1 & 2).
- The introduction of FCM in the treatment of anemia due to IDA in pregnant women generates an extra cost of BRL 269,773 in the first year, BRL 2,151,495 in the fifth year and accumulated extra cost of BRL 6,195,733. (Table 2).
- On the contrary, for the PPW, it generates a saving of BRL 2,701,510 in the first year, and BRL 21,545,402 in the fifth year and accumulate saving of BRL 61,996,565 over the LD-IV. (Table 3). This is due to the fact that LD-IV iron treatment is more expensive than FCM and the target population has shrunk over the years.

## CONCLUSIONS

- 75% of the Brazilian population have access to SUS treatment, 91,263 pregnant women and 65,150 PPW will require iron supplementation.
- Intravenous iron, particularly FCM, has been shown to be cost saving compared to LD-IV in the Brazilian SUS postpartum women population. This potential savings more than offset the extra cost for the pregnant women population.

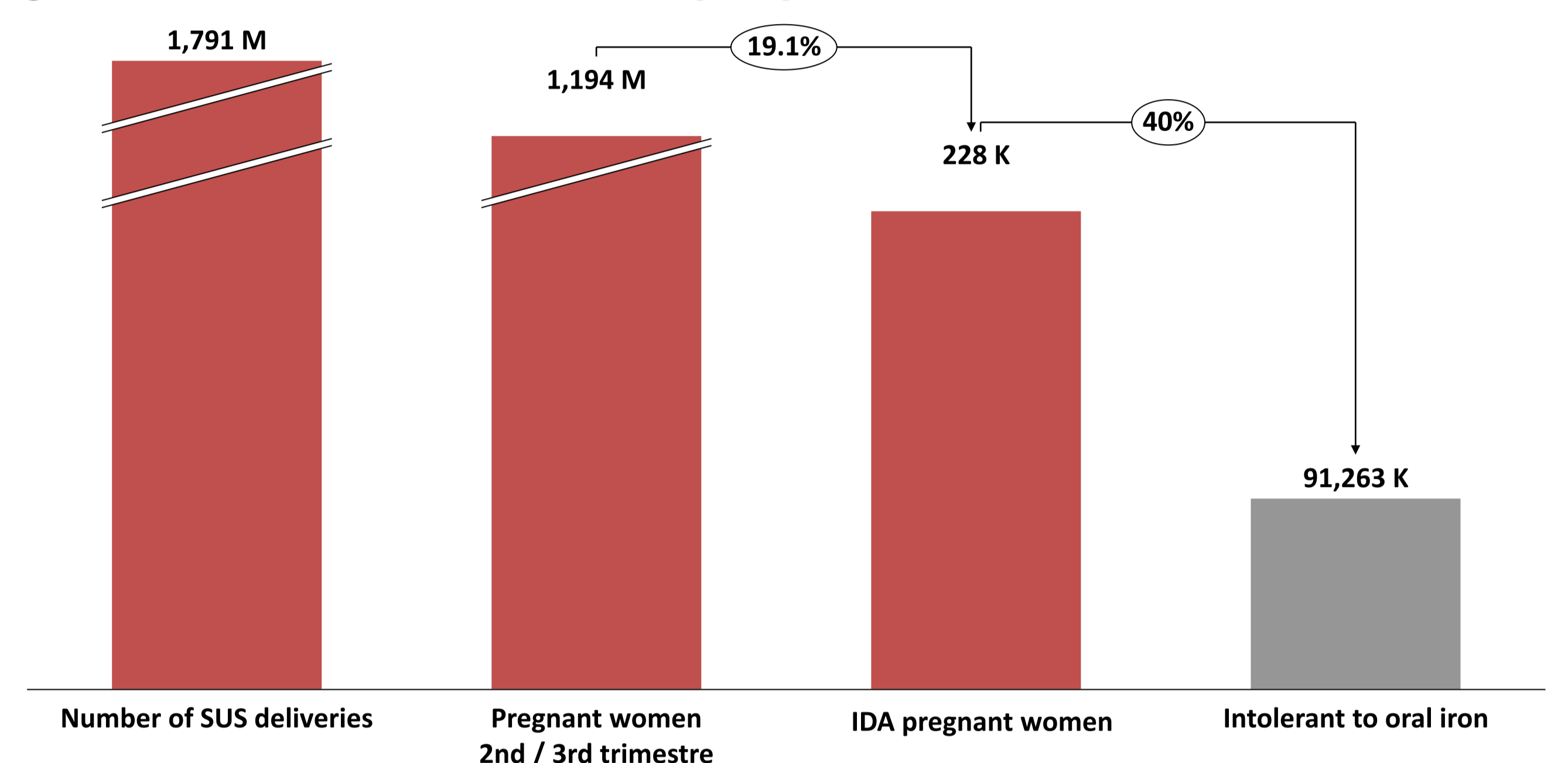
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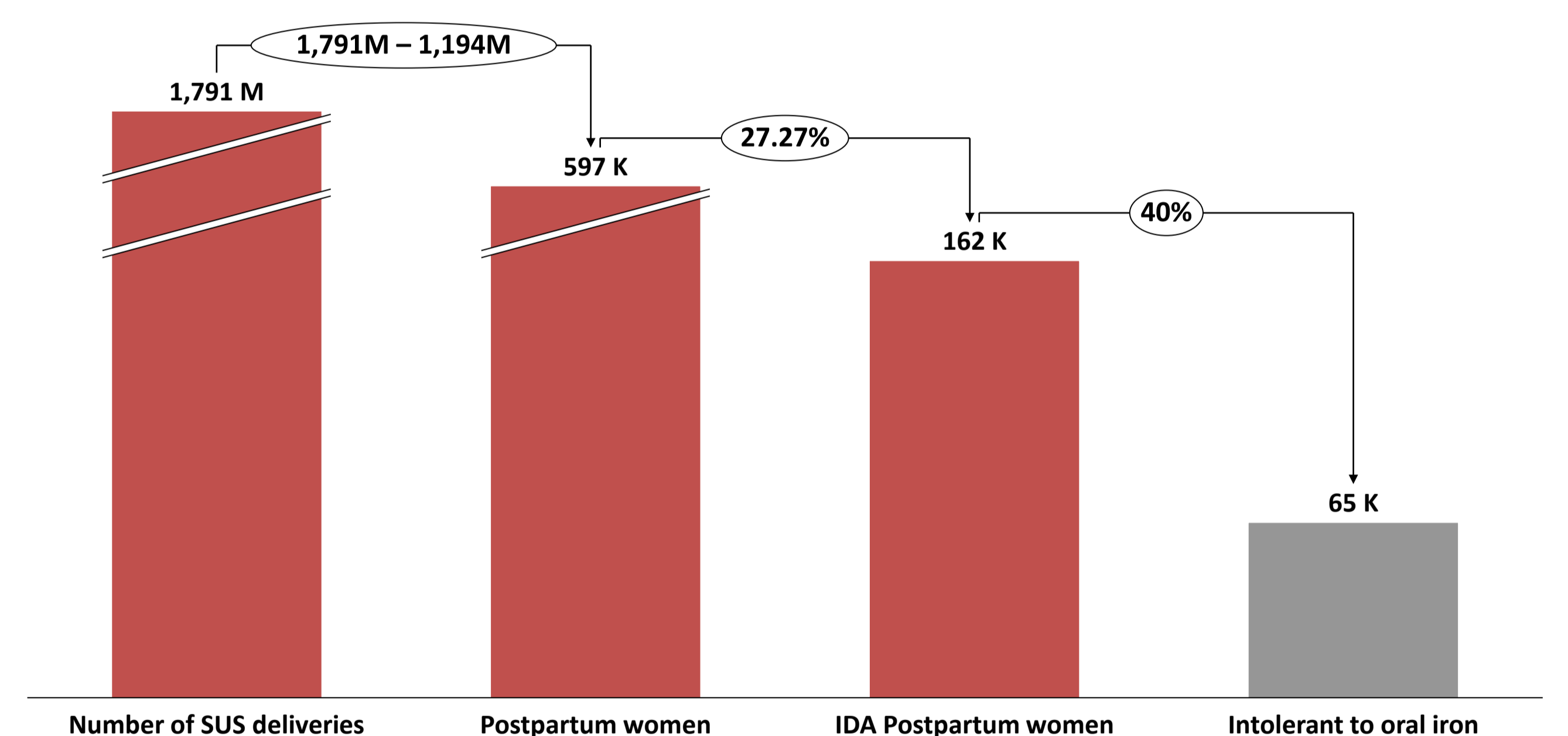
**Table 1. Estimated population of pregnant and postpartum women.**

Parameters	2023	2024	2025	2026	2027
number of SUS deliveries	1,791,806	1,790,452	1,788,481	1,787,352	1,786,266
2nd and 3rd trimester - pregnant women	1,194,538	1,193,634	1,192,321	1,191,568	1,190,844
Pregnant women with anemia	228,157	227,984	227,733	227,589	227,451
Pregnant population intolerant of oral iron	91,263	91,194	91,093	91,306	90,980
Postpartum women	597,269	596,817	596,160	595,784	595,422
Postpartum population with anemia	162,875	162,752	162,573	162,470	162,372
Eligible population - population intolerant to oral iron	65,150	65,101	65,029	64,988	64,949

**Figure 1. Flowchart and segmentation used to estimate the population of eligible pregnant women in Brazil from a SUS perspective in 2023.**



**Figure 2. Flowchart and segmentations used to define the size of the population of eligible postpartum women in Brazil from a SUS perspective in 2023.**



**Table 2. Analysis of the budgetary impact of replacing low-dose IV iron with FCM in the SUS for the treatment of pregnant women with IDA who are intolerant to oral treatment.**

	Current Situation (BRL)	Gradual Uptake of FCM (BRL)	Difference
2023	83'779'434	84'049'207	269'773
2024	83'716'092	84'524'800	808'708
2025	83'623'374	84'969'728	1'346'354
2026	83'818'908	85'438'311	1'619'403
2027	83'519'640	85'671'135	2'151'495
Total			6'195'733

(\*1 USD\$ = 5.13 BRL; 1 Euro € = 5.37 BRL).

**Table 3. Analysis of the budgetary impact of replacing low-dose IV iron with FCM in the SUS for the treatment of PPW with IDA who are intolerant of oral treatment.**

	Current Situation (BRL)	Gradual Uptake of FCM (BRL)	Difference
2023	119'615'400	116'913'890	-2'701'510
2024	119'525'436	111'427'001	-8'098'435
2025	119'393'244	105'910'781	-13'482'463
2026	119'317'968	103'149'213	-16'168'755
2027	119'246'364	97'700'962	-21'545'402
Total			-61'996'565

(\*1 USD\$ = 5.13 BRL; 1 Euro € = 5.37 BRL)