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SPRING NUTRITION TECHNICAL BRIEF

A RAPID INITIAL ASSESSMENT OF THE DISTRIBUTION AND CONSUMPTION OF IRON–FOLIC ACID TABLETS THROUGH ANTENATAL CARE IN HAITI

SEPTEMBER 2014

This document is part of a series of research briefs produced by USAID's Strengthening Partnerships, Results, and Innovations in Nutrition Globally (SPRING) project that use secondary analysis of Demographic and Health Survey data to determine barriers to distribution and consumption of iron–folic acid (IFA) through antenatal care systems in a range of countries. This brief describes key characteristics of and barriers to successful IFA supplementation in ***Haiti.***

ABOUT SPRING

The Strengthening Partnerships, Results, and Innovations in Nutrition Globally (SPRING) project is a five-year USAID-funded Cooperative Agreement to strengthen global and country efforts to scale up high-impact nutrition practices and policies and improve maternal and child nutrition outcomes. The project is managed by JSI Research & Training Institute, Inc., with partners Helen Keller International, The Manoff Group, Save the Children, and the International Food Policy Research Institute. SPRING provides state-of-the-art technical support and focuses on the prevention of stunting and maternal and child anemia in the first 1,000 days.

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OVERVIEW OF THE GLOBAL ANEMIA PROBLEM, INCLUDING IRON DEFICIENCY ANEMIA

The World Health Organization (WHO) defines anemia among women of childbearing age as the condition of having a hemoglobin concentration of < 12.0 g/dL at sea level; among pregnant women it is defined as < 11.0 g/dL. The hemoglobin concentration cutoff level that defines anemia varies by age, gender, physiological status, smoking status, and the altitude at which the assessed population lives.

The primary cause of anemia is iron deficiency, a condition caused by inadequate intake or low absorption of iron, the increased demands of repeated pregnancies—particularly if not well spaced (e.g., fewer than 36 months between pregnancies)—and loss of iron through menstruation. Other causes of anemia include vitamin deficiencies (such as a deficiency of folic acid or vitamin A), genetic disorders, malaria, parasitic infections, HIV, tuberculosis, common infections, and other inflammatory conditions. While iron deficiency anemia (IDA) accounts for about one-half of all anemia cases, it often coexists with these other causes.

Iron deficiency anemia is most common during pregnancy and in infancy, when physiological iron requirements are the highest and the amount of iron absorbed from the diet is not sufficient to meet many individuals' requirements (Stoltzfus and Dreyfuss 1998). Anemia's effects include increased risk of premature delivery, increased risk of maternal and child mortality, negative impacts on the cognitive and physical development of children, and reduced physical stamina and productivity of people of all ages (Horton and Ross 2003). Globally, IDA annually contributes to over 100,000 maternal deaths (22 percent of all maternal deaths) and over 600,000 perinatal deaths (Stoltzfus, Mullany, and Black 2004). Key anemia control interventions include promoting a diversified diet, iron-folic acid (IFA) supplementation during pregnancy, iron fortification of staple foods, prevention and treatment of malaria, use of insecticide-treated bed nets, helminth prevention and control, delayed cord clamping, and increased birth spacing.

MATERNAL ANEMIA IN HAITI

The prevalence of anemia among pregnant women in Haiti is 54 percent, making it a severe public health problem as defined by WHO standards[1] (Cayemittes et al. 2013). In terms of anemia severity, the majority of cases among pregnant and breastfeeding or non-pregnant women reported in the 2012 Haiti Demographic and Health Survey (HDHS) are classified as mild or moderate.[2] Less than one percent of anemia cases in pregnant and breastfeeding women and only one percent in non-pregnant women are diagnosed as severe. Since 2005, the prevalence of maternal anemia has risen slightly, by roughly three percentage points. This increase is due to increases in cases of mild anemia, as rates of moderate and severe anemia fell over the same period (Cayemittes et al. 2007).

FALTER POINTS IN WOMEN'S CONSUMPTION OF IRON–FOLIC ACID DURING PREGNANCY

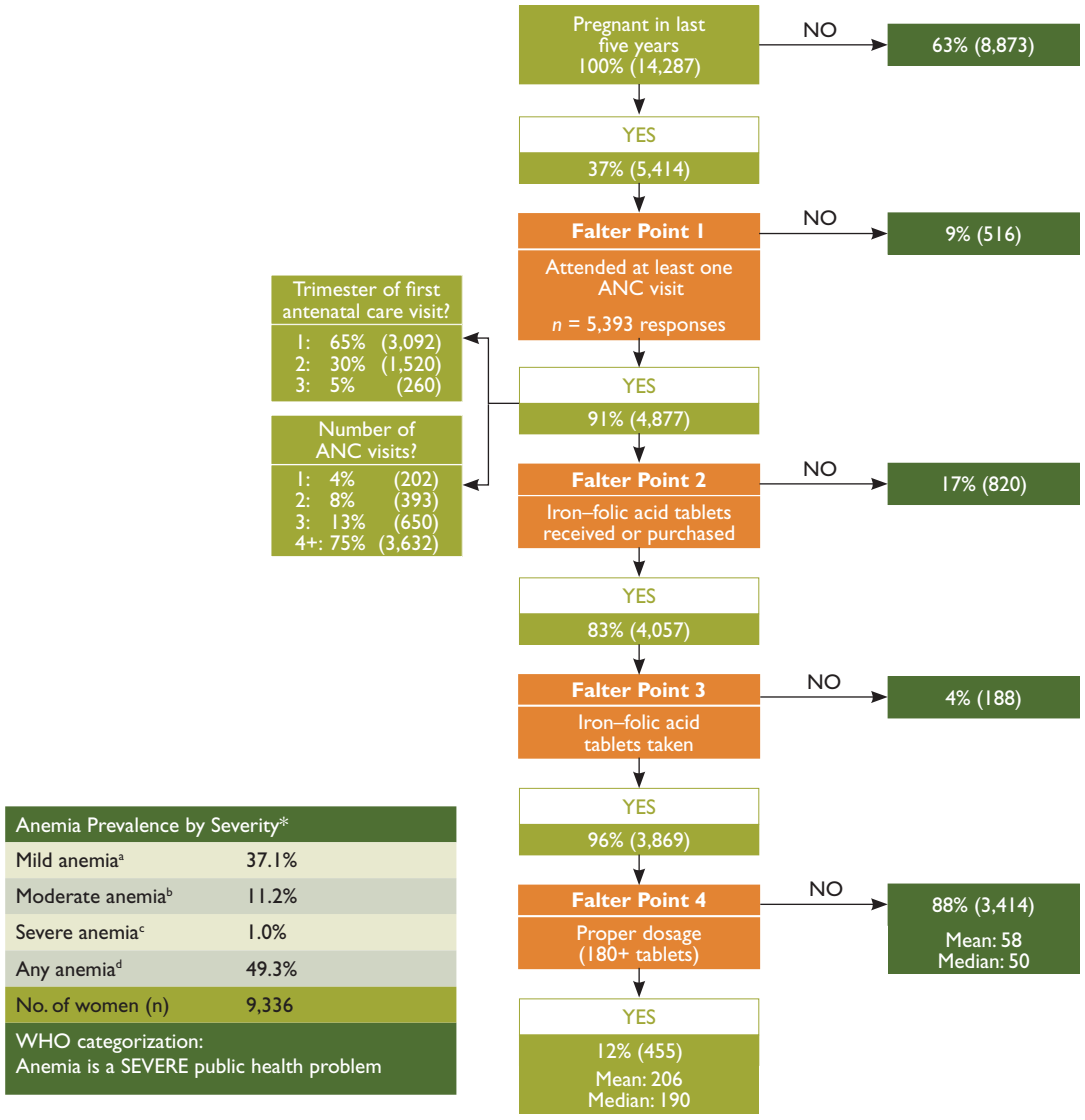
WHO recommends that all pregnant women receive a standard dose of 30–60 mg iron and 400 µg folic acid beginning as soon as possible during gestation (WHO 2012a). Ideally, women should receive iron-containing supplements no later than the first trimester of pregnancy, which means ideally taking 180 tablets before delivery. It is important to note, that many countries aim for women to receive 90 or more tablets during pregnancy.

Figure 1 shows a decision-tree analysis of how well the Haitian antenatal care (ANC) system distributes IFA, and identifies four points at which the system might falter (highlighted in orange). The figure tracks the number and percentage of women who obtained ANC, those who subsequently received and consumed at least one IFA tablet, and those who consumed the ideal minimum number of

[1] WHO categorizes the severity of anemia as a public health problem according to the condition's prevalence: < 5 percent, no public health problem; 5–19.9 percent, mild; 20–39.9 percent, moderate; ≥ 40 percent, severe.

[2] The DHS hemoglobin levels used to diagnose the severity of anemia in non-pregnant women differ from those specified by WHO. The DHS cutoffs for pregnant (P) and non-pregnant (NP) women in hemoglobin g/dL are mild, 10.0–10.9 (P), 10.0–11.9 (NP); moderate, 7.0–9.9 (P), 7.0-9.9 (NP); severe, <7.0 (P), <7.0 (NP); any <1 1.0 (P), <12.0 (NP).

Figure 1. Analysis of Falter Points Related to Distribution and Consumption of IFA through Haiti's ANC Program in 2012, Women of Reproductive Age (15–49 Years) *n* = 14,287



Main Conclusions: Given the high coverage rate, ANC provides an outstanding platform for distributing IFA. Among women who were pregnant in the last five years, had at least one ANC visit, and took at least one IFA tablet, only 12 percent received and took the ideal minimum number of tablets. The most important shortcoming is Falter Point 4, followed by Falter Point 2. Both supply and demand are possible constraints and require further investigation.

Percentages are calculated from weighted data and may vary slightly from the unweighted observations-based calculations. One percent of women who were pregnant in the last five years did not have any ANC visits but received or purchased IFA from another source.

*Percentage of women 15–49 years based on Hemoglobin levels, Hb (g/dL)

[a]NPW 10.0≤Hb≤11.9, PW 10.0≤Hb≤10.9 [b] NPW 7.0≤Hb<9.9, PW 7.0≤Hb<9.9 [c]NPW Hb<7.0, PW Hb<7.0 [d]NPW Hb<12.0, PW Hb<11.0

Non-responses, no data (NR/ND) were recoded to "No" for "At least one ANC visit?", "IFA tablets received?" and "IFA tablets taken?" and to zero for "Number of tablets taken?".

Anemia prevalence data are provided as a reference point, signaling the general order of magnitude of the anemia public health problem. The ANC utilization data is based on self-reported data of women 15–49 years in permanent unions and pertains to their last pregnancy in the last five years prior to the DHS.

Source: Calculations and anemia levels are from the Haiti Demographic and Health Survey (2012).

tablets.[3] All data are based on HDHS questions asked of women who were in permanent unions and had been pregnant in the five years prior to being interviewed[4] (Cayemittes et al. 2013).

Many supply-side aspects—including both adequacy of IFA tablet supplies and technical knowledge and practices of ANC providers—need to be considered when assessing how well an ANC program delivers IFA. In addition, as Falter Point 4 in Figure 1 clearly shows, the provision of IFA tablets to a pregnant woman is a necessary but not sufficient condition for the woman to consume the tablets, particularly at the ideal minimum level. Thus, demand-side factors also play a critical role in determining the coverage and effectiveness of a program. These include whether or not women seek ANC and the timing and number of visits, as well as the extent to which women are aware of the significance of anemia and IFA, ask for IFA tablets, and comply with the IFA regimen.

Understanding the relative significance of each falter point makes it possible to prioritize them for more in-depth analysis, providing a first step in an evidence-based approach to systematically improving the program. The DHS does not collect information on the number of IFA tablets received by women. In the case of Falter Point 4, this lack of data creates ambiguities that make it impossible to fully understand whether shortcomings of the system relate primarily to supply- or demand-side factors. Despite this limitation, the decision-tree analysis presented in Figure 1 still enables prioritizing the falter points for more in-depth analysis and action at the national, district, and health center levels.

ANALYSIS OF FALTER POINTS

FALTER POINT 1:

Did not attend at least one ANC visit

Only nine percent of women did not have at least one ANC visit.

ANC's high coverage gives it great potential as a vehicle for providing IFA.

FALTER POINT 2:

Did not receive or purchase at least one IFA tablet

Of the women who had at least one ANC visit, 17 percent did not receive or purchase any IFA tablets.

This supply-side constraint may be due to various system/supply-side performance shortcomings, which could reflect: (1) inadequate supply (e.g., stockouts); (2) inadequate provider knowledge; or (3) inadequate provider practices, whereby IFA may not have been provided. As Figure 2 shows, this is the second-most important falter point among all pregnant women in Haiti.

Unfortunately, the HDHS does not report the source(s) of the IFA tablets women received or purchased, and a small percentage of women attending ANC get IFA tablets from a different source. While 10 percent of Haitian women who received or purchased IFA did not have any ANC visits (not shown), we cannot ascertain whether or not those who received ANC obtained their IFA from their ANC provider. However, women who attend ANC may be more likely to be aware of, to value, and also to take IFA tablets, regardless of where they obtain them. Thus, we would expect a high correlation between the number of women who had at least one ANC visit and those who received or purchased IFA,which is consistent with the data. Women who had one or more ANC visits and who did not receive any IFA represent a missed opportunity to reduce the risk of anemia among a high-risk population.

FALTER POINT 3:

Did not take at least one IFA tablet

Of the women who received IFA, four percent did not consume any tablets.

This demand-side constraint is relatively small and may be due to women not understanding the significance of anemia and/or the significance of IFA. This misunderstanding may reflect: (1) inadequate provider counseling and follow-up; (2) women's beliefs about actual or possible side effects; or (3) sociocultural factors.

[3] The HDHS asked about IFA tablets or capsules; this brief refers to all forms as "tablets."

[4] The HDHS provides a population-based, nationally representative sample of all women in Haiti.

FALTER POINT 4:

Did not consume 180 or more IFA tablets

Of the women who received and took IFA, 88 percent did not consume the ideal minimum of 180 IFA tablets.

This constraint results from a combination of supply- and/or demand-side factors. Figure 1 suggests two situations that may contribute to this falter point: 35 percent of women who received ANC began their care after the first trimester, and the 25 percent who had fewer than WHO's recommended four ANC visits during their last pregnancy may have started their ANC too late or may not have had enough visits to receive 180 tablets (given IFA distribution protocols). Both of these scenarios are likely contributors, but further research is needed to establish their relative importance, as well as the significance of other possible causes.

Globally, research has found that the following situations often contribute to Falter Point 4: (1) providers do not have access to adequate supply; (2) women do not receive adequate tablets because they have little access to care, start ANC late, or do not have enough ANC visits, making it difficult to obtain 180 tablets (given IFA distribution protocols); (3) providers do not provide adequate counseling or follow-up; (4) women do not adhere to the regimen, which may be due to difficulty in remembering to take the tablets daily, not knowing all the tablets are necessary, fear of having a big baby, side effects, or tablet-related issues (taste, size, color, coating, packaging/storage problem). Further research is needed to determine the underlying factors contributing to this falter point in Haiti.

ANALYSIS BY SOCIODEMOGRAPHIC VARIABLES AND TRENDS OVER TIME

A comparison of 2005/2006 and 2012 HDHS data reveals several encouraging ANC trends, including: (1) the ANC coverage of pregnant women increased from 85 percent to 91 percent (Table 2) and (2) the proportion of women who had the WHO-recommended minimum of four visits increased from 54 percent to 67 percent (Table 1). In addition, (3) women who had a live birth in the past five years who took iron tablets or syrup increased by 17 percent, from 65 percent to 76 percent (Table 3). As may be seen in Table 2, ANC coverage now exceeds 85 percent in all geographic departments. Only one department, North-West, had a decrease in ANC coverage between 2005/2006 and 2012. Artibonite has made the most compelling improvements since 2000, from the lowest ANC

Table 1. Number and Timing of ANC Visits, Haiti, 2005/2006 and 2012

INDICATOR	2005/2006	2012	CHANGE IN COVERAGE	PERCENTAGE CHANGE
NUMBER OF ANC VISITS				
0	13.8%	9.4%	-4.4%	-31.9%
1	4.9%	3.7%	-1.2%	-24.5%
2-3	26.8%	19.0%	-7.8%	-29.1%
4+	53.8%	67.3%	13.5%	25.1%
Don't Know / No Data	0.6%	0.6%	0.0%	0.0%
MONTH OF FIRST VISIT				
No Antenatal Care	NA	9.4%		
<4 months	65.1%	59.5%	-5.6%	-8.6%
4-5	22.1%	21.4%	-0.7%	-3.2%
6-7	10.8%	8.4%	-2.4%	-22.2%
8+ months	1.5%	1.2%	-0.3%	-20.0%
Don't Know / No Data	0.4%	0.1%	-0.3%	-75.0%

Table 2. Percentage of Women Who Had a Live Birth in the Past Five Years and Who Had at Least One ANC Visit

DEPARTMENT	2000	2005/2006	2012	CHANGE IN PREVALENCE (2000-2012)	PERCENTAGE CHANGE (2000-2012)
Metropolitan Area	89.6%	86.9%	92.3%	2.7%	3.0%
North	80.6%	84.5%	88.0%	7.4%	9.1%
North-East	84.6%	87.5%	90.0%	5.4%	6.4%
North-West	85.2%	94.3%	90.0%	4.8%	5.7%
Artibonite	68.3%	86.7%	95.5%	27.2%	39.9%
Center	75.3%	82.4%	90.9%	15.6%	20.8%
West	72.7%	81.8%	94.0%	21.3%	29.3%
South	77.3%	83.8%	87.5%	10.2%	13.2%
South-East	74.0%	74.2%	87.5%	11.7%	15.8%
Grande-Anse	76.2%	81.2%	85.7%	17.9%	23.5%
Nippes		78.6%	89.8%		
NATIONAL AVERAGE	**80.0%**	**84.5%**	**90.6%**	**10.6%**	**13.3%**

Note: Nippes did not exist in 2000

coverage, at 68 percent, to the highest coverage in 2012, at 96 percent. While these changes show positive and pronounced trends, the prevalence of anemia among women aged 15–49 years rose from 46 percent to 49 percent and maternal anemia has remained a severe public health problem in Haiti (Table 4).

Table 3 shows the prevalence of anemia, ANC and IFA distribution coverage, and the consumption of IFA tablets across regions, urban/rural residence area, and wealth categories in 2012. Although there are some variations, none are particularly striking. It is interesting to note that the prevalence of anemia is lower among the 40 percent of households with the lowest incomes relative to the 40 percent of households with the highest incomes. The households in the lowest 40 percent of wealth were also less likely to have had ANC coverage, to have taken IFA, and to have taken at least one-half of the ideal minimum number of IFA tablets per pregnancy.

ANALYSIS BY GEOGRAPHIC REGION

Between 2000 and 2005/2006, Haiti made significant progress, cutting the prevalence of anemia from 55 percent to 46 percent, a reduction of 17 percent (Table 4). However, between 2005/2006 and 2012, improvements waned and the prevalence of anemia has slightly increased across all but two of Haiti's departments, although the majority of 2012 prevalence rates remain below 2000 levels. The most recent anemia estimates range from 38 percent in Grand-Anse and the South to 54 percent in metropolitan areas and the North. Although 2012 rates are lower, every department (with the exception of the South, Nippes, and Grand-Anse) had a prevalence rate of anemia that classified it as a severe public health problem according to WHO standards. The largest reductions were made in Grand-Anse, South, and Center, with the Grand-Anse and South departments now among those with the lowest prevalence rates. Increases in prevalence were seen in the North and Artibonite, which are now among the departments with the highest prevalence rates.

Figure 2 shows the variation by department in the percentage of women who had at least one ANC visit and who reported receiving at least one IFA tablet. There is relatively little variation, and with rates ranging from 77 percent to 91 percent, the

percentages are relatively high compared with other lower- and middle-income countries. Although the mean number of tablets taken is fairly consistent across provinces (not shown), in those provinces in which women were more likely to have had at least one ANC visit and report taking at least one IFA tablet, they were also more likely to receive and take more tablets. In all 11 of the provinces, however, the number of tablets taken ranges from one-third to just over one-half of the ideal minimum of 180, and is inadequate.

ANALYSIS BY NUMBER OF ANC VISITS

Figure 3 shows the relationship between the number of IFA tablets taken by women who had at least one ANC visit and the number of ANC visits they had during their last pregnancy. Among all women

Figure 2. Percentage of Women Who Had at Least One ANC Visit and Received at Least One IFA Tablet by Department, Haiti, 2012

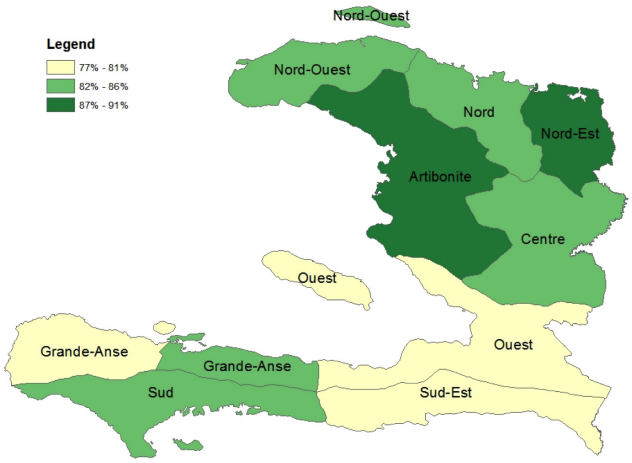


Table 3. Prevalence of Anemia, and Coverage of ANC and IFA Among Haitian Women Aged 15–49 Years, Haiti, 2012

CHARACTERISTIC	PREVALENCE OF ANEMIA	ANC COVERAGE*	TOOK 1+ IFA	TOOK 90+ IFA
DEPARTMENT				
Metropolitan Area	53.7%	92.3%	76.6%	26.7%
North	53.7%	88.0%	78.2%	40.9%
North-East	52.6%	90.0%	87.8%	41.9%
North-West	46.2%	90.0%	78.1%	32.1%
Artibonite	52.5%	95.5%	80.4%	32.9%
Center	46.6%	90.9%	78.8%	34.7%
West	46.0%	94.0%	69.2%	24.4%
South	38.4%	87.5%	75.3%	26.3%
South-East	46.4%	85.7%	69.6%	17.5%
Grande-Anse	38.1%	94.1%	71.4%	25.3%
Nippes	39.2%	89.8%	76.7%	27.6%
RESIDENCE				
Urban	53.9%	93.2%	79.2%	31.9%
Rural	45.3%	89.0%	74.1%	28.2%
WEALTH				
Lowest 40%	43.9%	85.9%	69.1%	23.5%
Highest 40%	51.7%	95.7%	84.2%	33.5%
NATIONAL AVERAGE	**49.3%**	**90.6%**	**76.1%**	**29.6%**

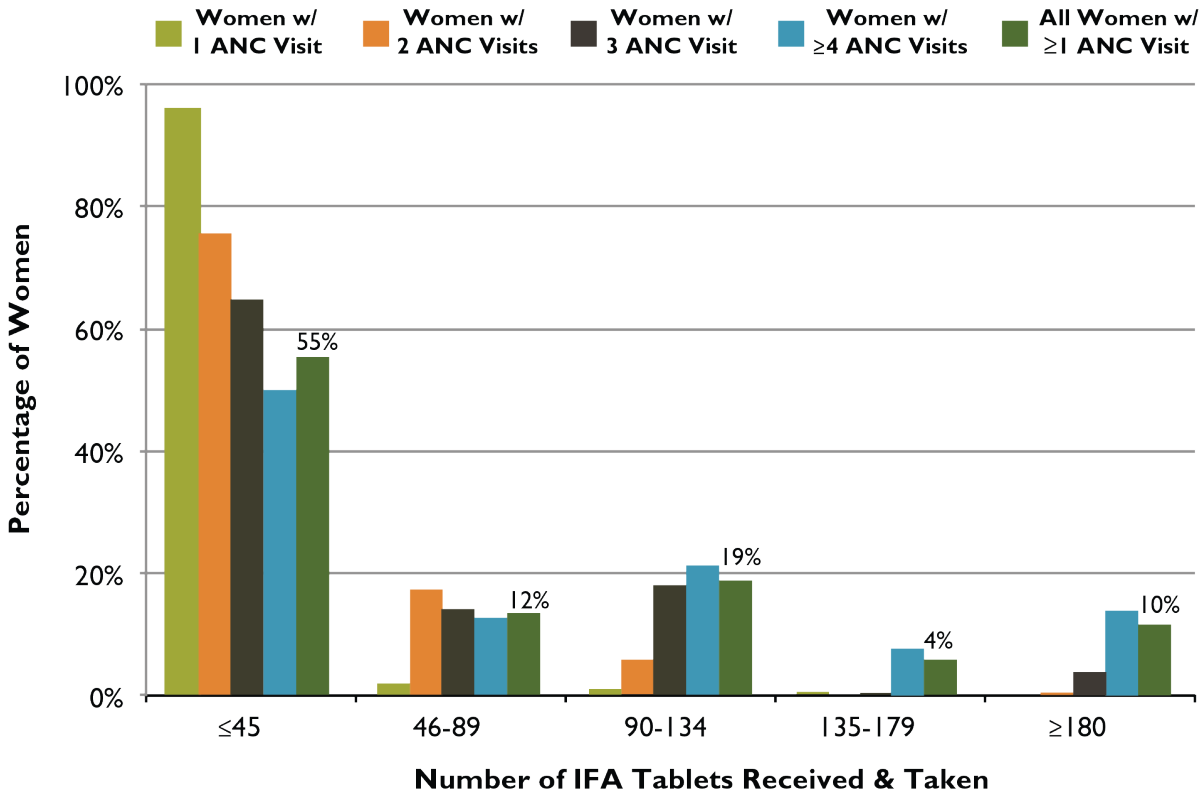
*During the Pregnancy of their last live birth in the past five years
Note: The 2012 HDHS used a 90-plus upper limit for IFA tablets.

Table 4. Changes in the Prevalence of Anemia Among Haitian Women Aged 15–49

DEPARTMENT	2000	2005/2006	2012	CHANGE IN PREVALENCE (2000-2012)	PERCENTAGE CHANGE (2000-2012)
Metropolitan Area	56.4%	51.7%	53.7%	-2.7%	-4.8%
North	50.9%	45.5%	53.7%	2.8%	5.5%
North-East	62.7%	39.6%	52.6%	-10.1%	-16.1%
North-West	51.7%	40.2%	46.2%	-5.5%	-10.6%
Artibonite	50.7%	48.1%	52.5%	1.8%	3.6%
Center	59.6%	42.5%	46.6%	-13.0%	-21.8%
West	57.0%	44.7%	46.0%	-11.0%	-19.3%
South	54.7%	41.8%	38.4%	-16.3%	-29.8%
South-East	51.3%	36.5%	46.4%	-4.9%	-9.6%
Grande-Anse	58.2%	42.6%	38.1%	-20.1%	-34.5%
Nippes		37.8%	39.2%		
NATIONAL AVERAGE	**55.1%**	**45.8%**	**49.3%**	**-5.8%**	**-10.5%**

Note: Nippes did not exist in 2000

Figure 3. ANC Distribution of IFA Tablets: Number of Tablets Received and Taken According to Number of ANC Visits, Haiti, 2012



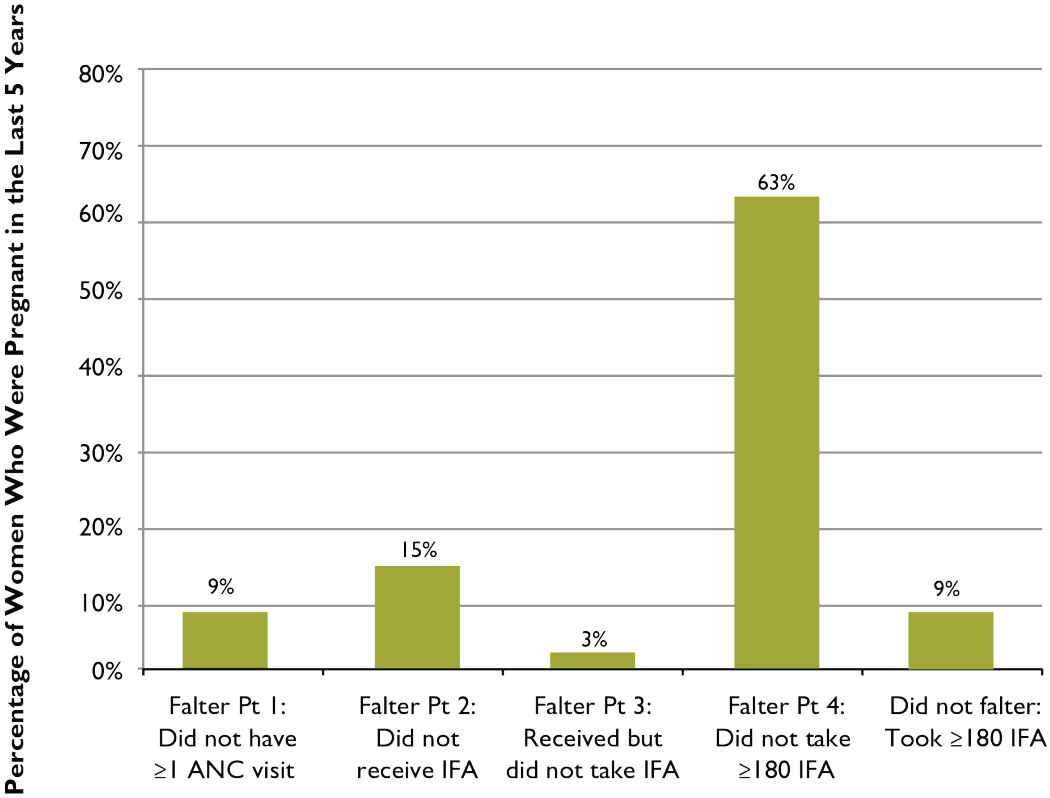
who had at least one ANC visit, 55 percent took at most one-quarter (45) of the ideal minimum number of IFA tablets. While women with more visits were likely to receive and take more IFA tablets, the relationship is not a strong or systematic one; additional ANC visits usually, but not always, result in a modest increase in the number of IFA tablets consumed. Most commonly, women took fewer than 45 tablets, regardless of how many visits they had. Even among those women who received IFA tablets and had four or more visits, 49 percent took at most only one-quarter of the ideal minimum.

OVERALL CONCLUSIONS AND RECOMMENDATIONS

Figure 4 presents the obstacles among all women, including those who did not receive ANC during their pregnancy, to taking the minimum ideal number of IFA tablets. In Haiti, Falter Points 2 and 4 are the greatest barriers. Improving the delivery of IFA supplementation in Haiti will therefore rely heavily on identifying and addressing program gaps in IFA supply management and health workers' practices. Modifying some women's long-term adherence behaviors, and addressing other points mentioned above, under "Analysis of Falter Points," may also lead to more women taking a minimum of 180 tablets (addressing Falter Point 4).

This rapid assessment of the distribution of IFA tablets through Haiti's ANC program suggests that although there has been growth in the coverage of ANC and coverage across departments is generally high, there is substantial room for improvement in both the supply and demand sides of the program. In 2000, Haiti's maternal mortality rate (MMR) was 450 maternal deaths per 100,000 live births, ranking it 145th among 181 reporting countries. Despite the fact that it reduced its MMR in 2005 by 11 percent, its ranking slipped to 146th. Over the subsequent five years, Haiti was able to accelerate the reduction of its MMR to 15 percent from its 2005 level (WHO 2012b). Again, however, its ranking slipped, as many countries that had similar rates have made even greater progress. As of 2010, there were only 29 countries with an MMR higher than Haiti's 350. One way Haiti might accelerate its progress in reducing the MMR would be to improve the distribution of IFA through its ANC program. With

Figure 4. Relative Importance of Each Falter Point in Haiti: Why Women Who Were Pregnant in the Last Five Years Failed to Take the Ideal Minimum of 180 IFA Tablets



Note: Due to rounding and missing values, data may not sum to 100 percent.

a 91 percent coverage rate of ANC, the potential is there. Improving the distribution of IFA through ANC is an important strategy for preventing and controlling anemia in Haiti, and for improving the nutrition and health status as well as the mental and physical capacity of women of reproductive age.

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