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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 NIGERIA

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 ***Nigeria.***

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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DISCLAIMER

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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 NIGERIA

According to the most recent and available national data—now more than two decades old—the prevalence of anemia among pregnant women in Nigeria is 67 percent, making it a severe public health problem as defined by WHO standards[1] (FMHSS and USAID 1996). Though the prevalence of anemia is equally high among non-pregnant women of reproductive age (62 percent), pregnancy is associated with a two-fold increased risk of anemia. Regionally, the highest rates of maternal anemia are found in the South-West zone. In a more recent study among pregnant women seeking antenatal care at a medical center in Nigeria's south-western Oyo State, anemia prevalence was found to be 58 percent (Owolabi, Owolabi and OlaOlorun 2012). Additionally, low socioeconomic status was significantly associated with higher prevalence rates and increased severity of anemia.

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

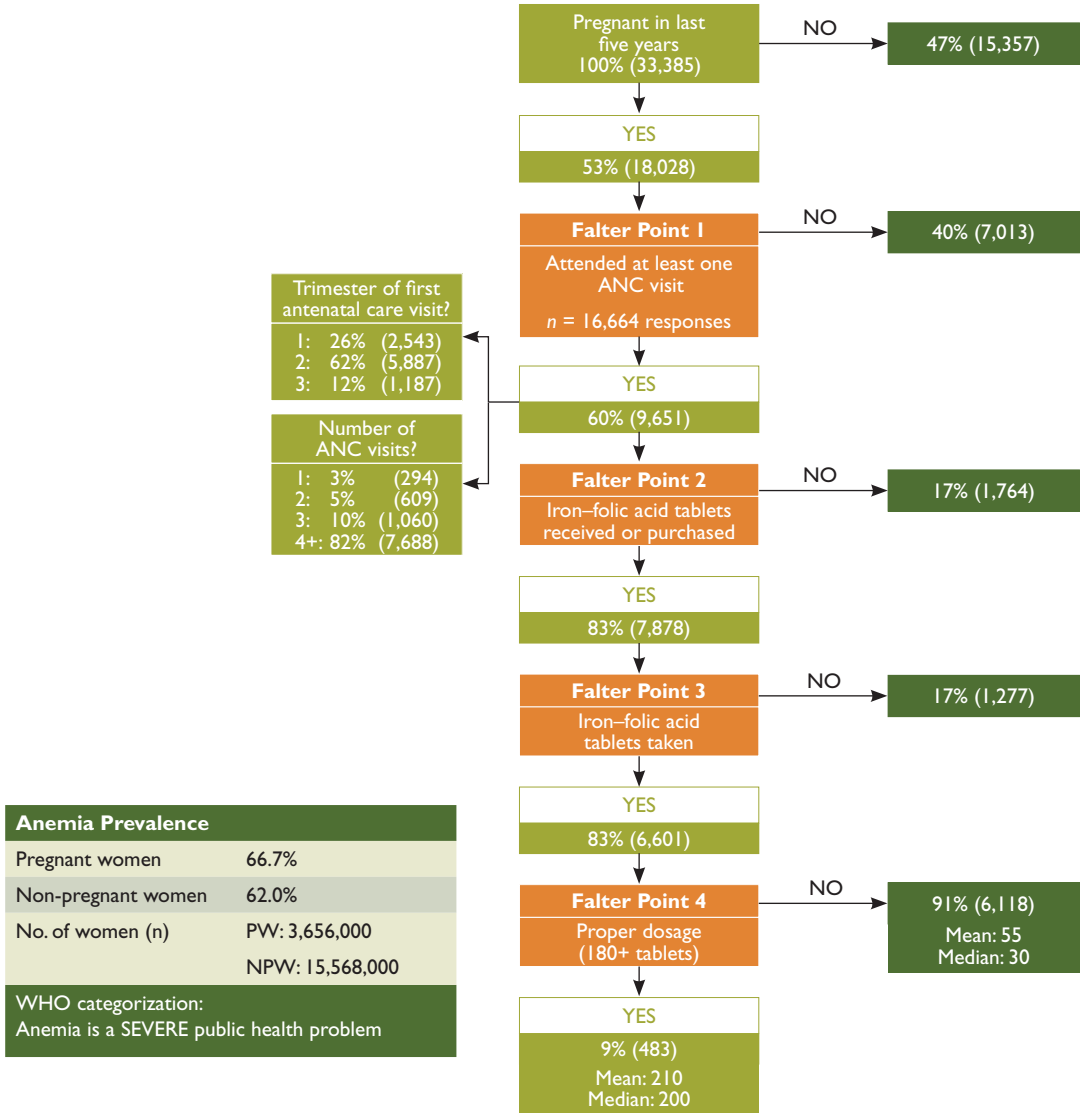
WHO recommends that all pregnant women receive a standard dose of 30–60 mg iron and 400 µg folic acid beginning as soon as possible during gestation (WHO 2012a). Ideally, women should receive iron-containing supplements no later than the first trimester of pregnancy, which means ideally taking 180 tablets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

Figure 1 on the following page shows a decision-tree analysis of how well the Nigerian antenatal care (ANC) system distributes IFA, and identifies four potential 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 tablets.[2] All data are based on

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

[2] The NDHS asked about IFA tablets or capsules; this brief refers to all types as "tablets."

Figure 1. Analysis of Falter Points Related to Distribution and Consumption of IFA through Nigeria's ANC Program in 2008, Women of Reproductive Age (15–49 years) *n*=33,385



Main Conclusions: Given its moderate coverage rate, ANC is currently an underutilized platform for distributing IFA in Nigeria. Among women who were pregnant in the last five years, had at least one ANC visit and took at least one IFA tablet, only nine percent received and took the ideal minimum number of tablets. The most important shortcomings are Falter Points 1 and 4, though 2 and 3 are significant as well. Supply and demand are both likely constraints.

All percentages reflect weighted data and may not match with unweighted observations numbers.
Anemia hemoglobin cutoffs: PW Hb <11.0 g/dl; NPW Hb<12.0i g/dl
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 are from the Nigeria Demographic and Health Survey (2008). Anemia levels are from WHO Global Database on Anemia, 2005.

Nigeria Demographic and Health Survey (NDHS) questions that were asked of women who were in a permanent union and had been pregnant in the five years prior to being interviewed[3] (NPC and ICF Macro 2009).

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, Falter Point 4 in Figure 1 clearly shows that 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. Thus, demand-side factors also play a critical role in determining the coverage and effectiveness of this program. These include whether or not women seek antenatal care 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 enables them to be prioritized 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 to 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

Forty percent of women did not obtain at least one ANC visit.

ANC's moderate coverage underutilizes the platform as a vehicle for providing IFA.

[3] The NDHS provides a population-based, nationally representative sample of all women in Nigeria.

FALTER POINT 2:

Did not receive or purchase at least one IFA tablet

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

This system/supply-side constraint is relatively small and may be due to performance shortcomings that need additional analysis, including: (1) Inadequate supply (e.g., stock outs); (2) Provider knowledge; (3) Provider practices that may have failed to provide IFA.

Unfortunately, the NDHS does not report the source(s) of the IFA tablets women received or purchased. It is likely that women who attend ANC are more likely to be aware of, to value and to be inclined to also take IFA, regardless of where they obtain them. Thus we would expect there to be 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. While six percent of Nigerian women who received or purchased IFA did not have any ANC visits (not shown), we cannot ascertain whether or not those who received ANC care obtained their IFA from their ANC provider. What is known, however, is that women who have one or more ANC visits and who did not receive any IFA, constitute 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, 17 percent did not consume any tablets.

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

FALTER POINT 4:

Did not consume 180 or more IFA tablets

Of the women who received and took IFA, 91 percent did not consume the ideal minimum of 180 IFA tablets.

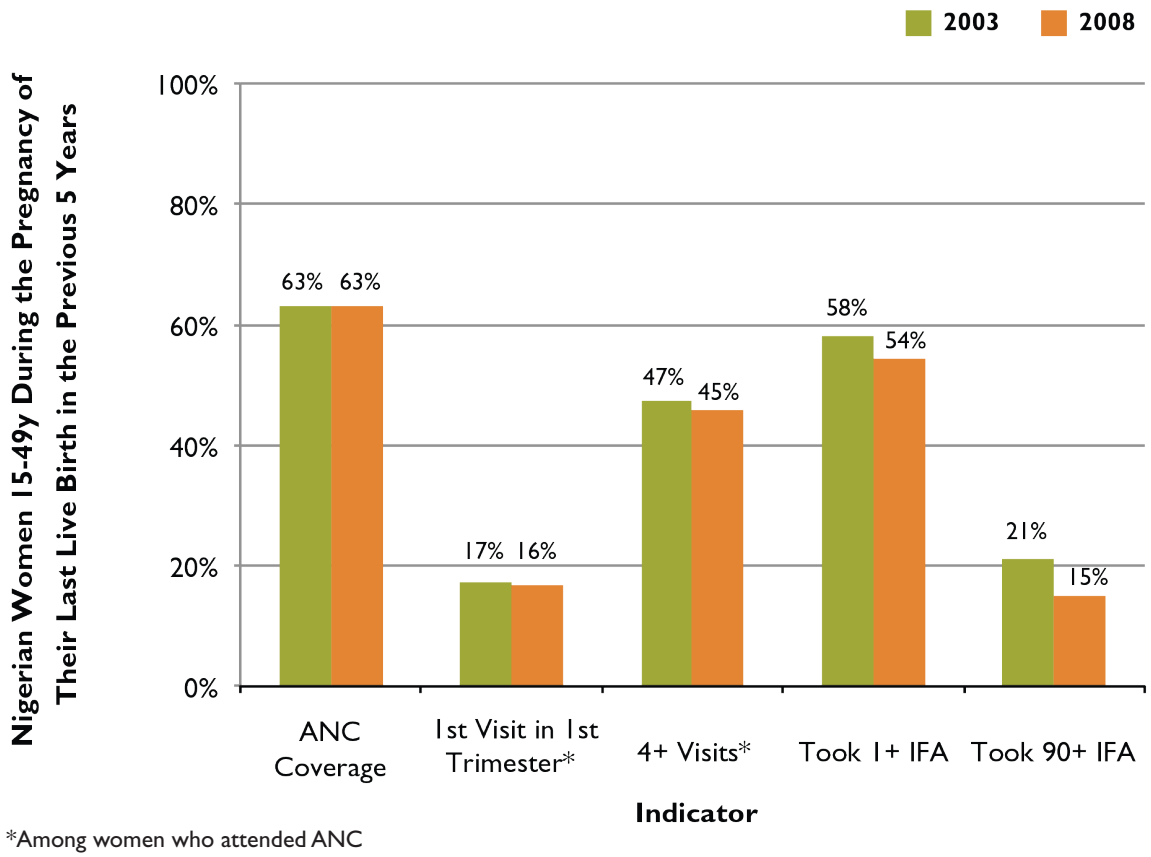
This is a combination of supply and/or demand-side factors. Figure 1 sheds some light on two possible causes of this falter point: 74 percent of women who received ANC began their care after the first trimester, and the 18 percent who had less than WHO's recommended four ANC visits during their last 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 are likely contributing factors, but further research is needed to establish their relative importance, as well as the significance of other possible causes.

Globally, research has found that other common causes of Falter Point 4 include: (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 specific reasons for this falter point in Nigeria.

ANALYSIS BY SOCIODEMOGRAPHIC VARIABLES AND TRENDS OVER TIME

A comparison of data from the 2003 and 2008 NDHS (Figure 2) reveals that ANC coverage has stagnated over the five year period. Only 63 percent of women in 2003 and 2008 had at least one ANC visit. Sixteen percent of women in 2008 received their first ANC within the first trimester and the percentage of women with four or more ANC visits, as recommended by the WHO, dropped by two percentage points to 45 percent. IFA coverage (defined as the percentage of women, among all women who were pregnant in the past five years,

Figure 2. Progress in ANC and IFA Indicators in Nigeria, 2003–2008



*Among women who attended ANC
Note: The 2008 NDHS used a 90+ IFA tablet upper limit.

who received and took at least one IFA tablet) and the percentage of pregnant women taking 90+ tablets also fell to 54 and 15 percent.

Table 1 shows marked variations in ANC coverage and consumption of IFA tablets across zones, urban/rural residence, and wealth. With the exception of North Central, the percentage of women who obtained at least one ANC visit in the southern zones is nearly double the rate of ANC coverage in the northern zones. The percentage of women who received and consumed at least one IFA tablet is also substantially higher in the southern zones than the northern zones. The inequalities in ANC and IFA coverage between urban and rural areas and between the lowest and highest wealth quintiles are similarly stark, with both varying by a factor of nearly two.

Figure 3. Percentage of Women Who Had at Least One ANC Visit and Received at Least One IFA Tablet by Region, Nigeria, 2008

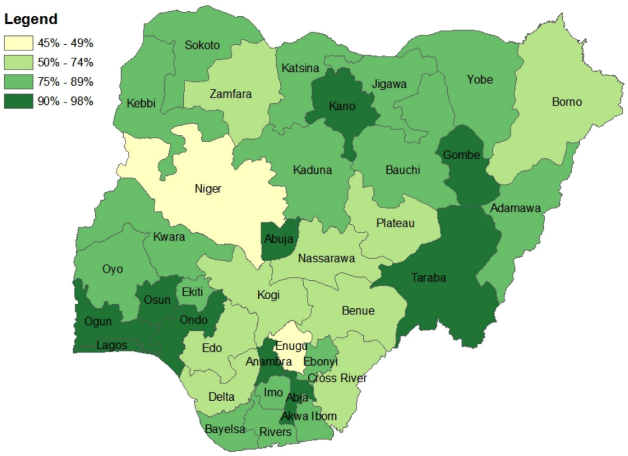


Table 1. ANC Coverage and IFA Tablets Taken During Last Pregnancy in the Last Five Years by Geographic Area, Wealth, and Residence, Nigeria, 2008

CHARACTERISTIC	NO. WOMEN WITH A LIVE BIRTH—LAST 5 YEARS*	RECEIVED ANC		TOOK 1+ IFA TABLET	
		NUMBER	PERCENTAGE	NUMBER	PERCENTAGE
ZONE					
North Central	2,525	1,854	73.4%	1,270	50.3%
North East	2,751	1,337	48.6%	1,265	46,0%
North West	5,372	1,730	32.2%	1,644	30.6%
South East	1,603	1,480	92.3%	1,230	76.7%
South South	2,310	1,869	80.9%	1,474	63.8%
South West	3,075	2,887	93.9%	2,700	87.8%
RESIDENCE					
Urban	5,330	4,677	87.7%	4,125	77.4%
Rural	12,305	6,480	52.7%	5,463	44.4%
WEALTH					
Lowest 40%	7,990	3,000	37.5%	2,462	30.8%
Highest 40%	6,295	5,761	91.5%	5,145	81.7%
NATIONAL AVERAGE	**17,635**	**11,158**	**63.3%**	**9,576**	**54.3%**

*Unweighted

ANALYSIS BY GEOGRAPHIC REGION

The map in Figure 3 shows how the percentage of women who had at least one ANC visit and received at least one IFA tablet varies by region. The percentage varies widely, by a factor of more than two. The map may be used to prioritize regions for more in-depth investigation of the shortcomings that are suggested by the earlier analysis. Better understanding of the specific causes of the shortcomings is essential to developing activities to address them and to increasing the ANC-based distribution of IFA.

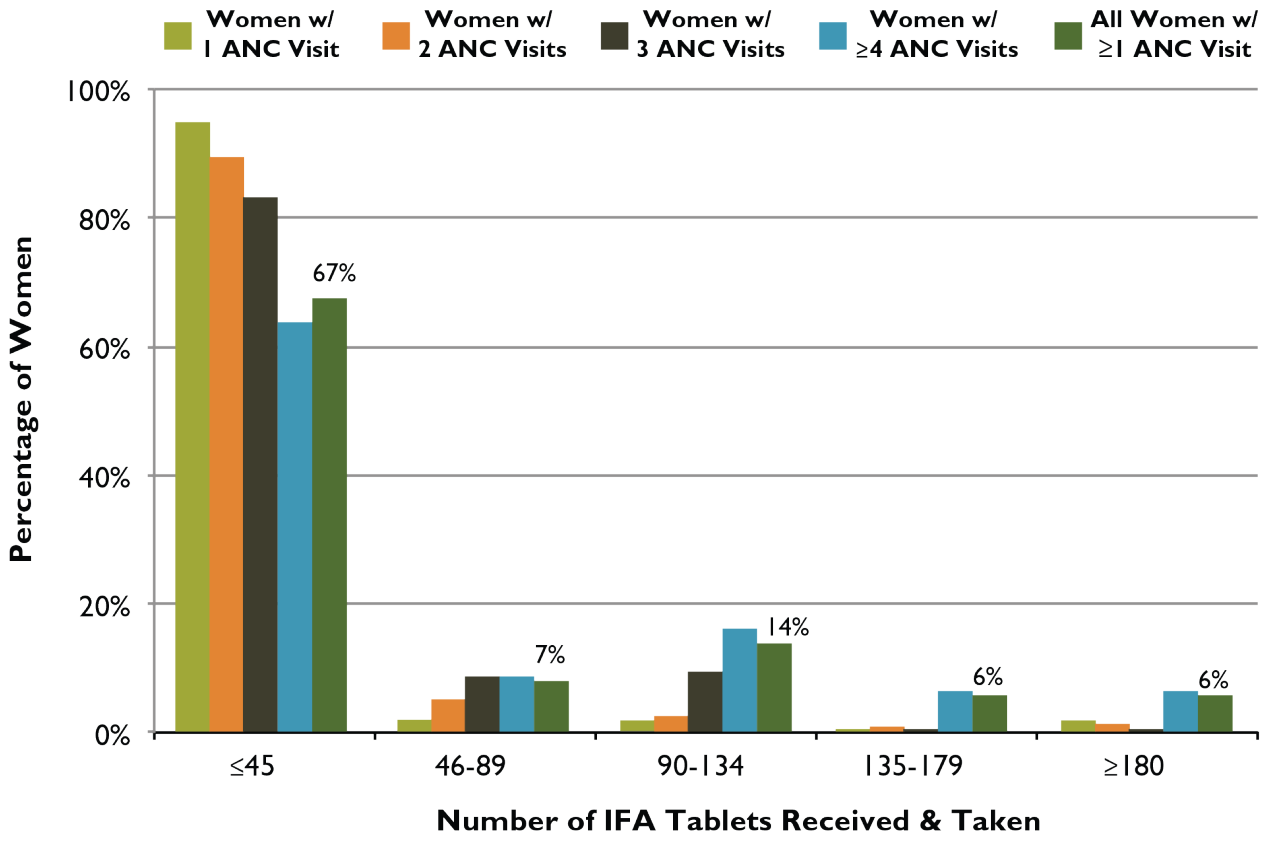
ANALYSIS BY NUMBER OF ANC VISITS

Figure 4 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. Sixty-seven percent of the women who had at least one ANC visit received and 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 weak: regardless of the number of ANC visits they had, half of all women received only 45 IFA tablets. After the first visit, additional ANC visits result in only small additional increases in the number of IFA tablets consumed. Even among those women who received IFA tablets and had four or more visits, 63 percent took at most only one-quarter of the ideal minimum number.

OVERALL CONCLUSIONS AND RECOMMENDATIONS

Figure 5 presents the obstacles among all women, including those who did not receive ANC during their pregnancy, to taking the ideal minimum number of IFA tablets. In Nigeria, Falter Points 1 and 4 seem to be the greatest barriers; though 2 and 3 may

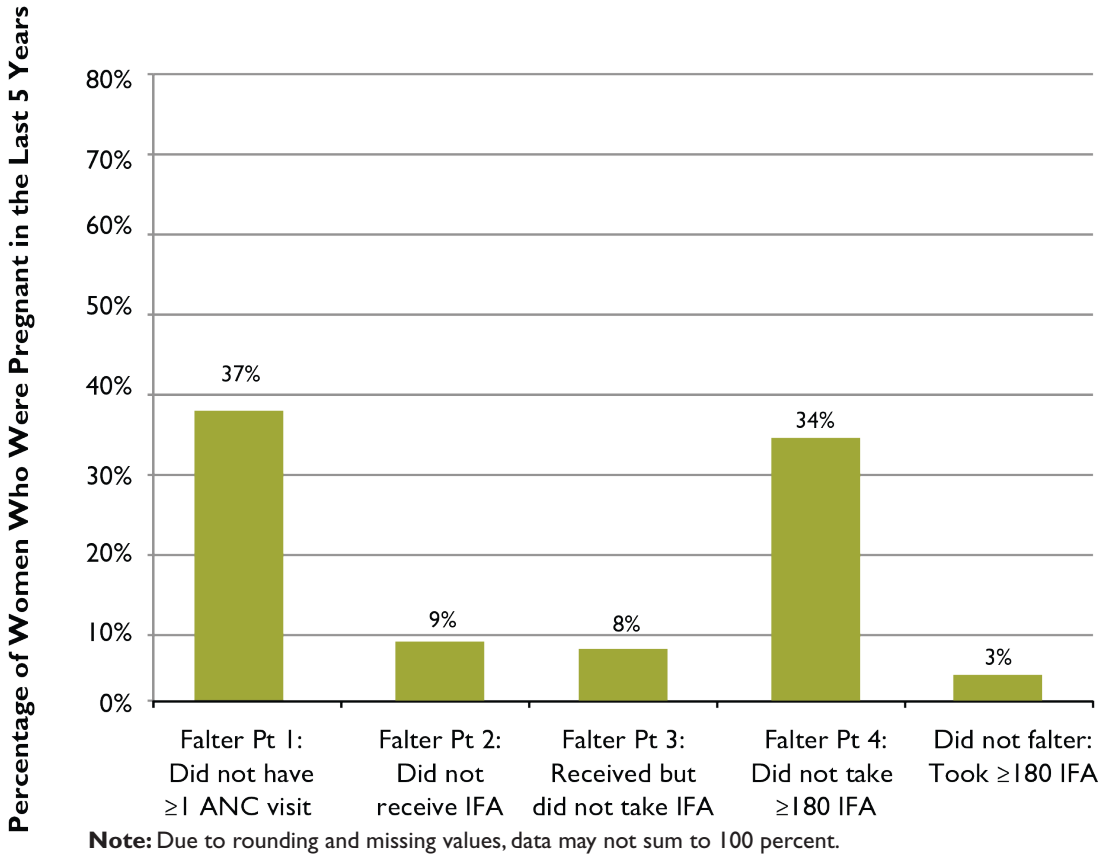
Figure 4. ANC Distribution of IFA Tablets: Number of Tablets Received and Taken According to Number of ANC Visits, Nigeria, 2008



also be important. Improving the delivery of IFA supplementation in Nigeria relies on increasing access to ANC (addressing Falter Point 1) but also on identifying and addressing program gaps in IFA supply management and health workers' practices (to improve performance at Falter Points 2 and 4). In addition to supply-side factors, modifying 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 Points 3 and 4).

This rapid initial assessment of the distribution of IFA tablets through Nigeria's ANC program suggests that there is substantial room for improvement in both the supply- and demand-sides of the program. In light of Nigeria's high maternal mortality rate—estimated in 2010 to be 630 maternal deaths per 100,000 live births, the 10th highest among 181 countries (WHO 2012b)— improving the distribution of IFA through the ANC program should be a priority for Nigeria. To accelerate its progress toward achieving its fifth Millennium Development Goal (MDG 5) to improve maternal health, Nigeria should conduct additional studies to identify and prioritize the causes of the faltering performance of its ANC-based IFA distribution, so that it can begin addressing these shortcomings. Given that 64 percent of the Nigerian women who had at least one ANC visit received their care in a public facility, Ministry of Health facilities should be the focus of this work. The significant share of the private sector in providing ANC care, however, suggests that it too warrants attention (NPC and ICF Macro 2009). Improving the distribution of IFA through the ANC program is an important strategy to prevent and control anemia in Nigeria, and to improving the nutrition and health status, and the mental and physical capacity of women of reproductive age.

Figure 5. The Relative Importance of Each of the Falter Points in Nigeria: 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.

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