onitoring and Accountability 2020 (PMA2020) household and female surveys. Later sections detail the parameters of the sample size calculations and the states for which the sample is representative specific to the country. The last section provides methods regarding post-stratification weights to calculate national-level estimates, unique for Nigeria PMA2020.

## 1. General sampling procedures for PMA2020

The sample size requirements for PMA2020 are determined to calculate the modern contraceptive prevalence rate (mCPR) for all women at a desired level of precision (margin of

ey due to budget and logistical constraints, we employ multistage stratified clustered sampling, where households are surveyed in clusters or enumeration areas (EAs), which are selected first—with a probability proportional to size (PPS) method--and independently within sampling strata. All women of reproductive age 15-49 years are the targeted population for interviews. The formula used to determine the final sample size of women is:

$$\overline{\phantom{xxxxxxxx}}$$

where  $n$ is the sample size of women;

Z is the abscissa of normal curve (at  =0.05, Z=1.96)

*DEFF* is the design effect due to multi-stage stratified cluster sampling (a maximum of 3.0 is imposed);

*P* is the estimated (expected) mCPR;

 is the desired margin of error;

$R_i$ is the individual response rate; and

$R_h$ is the household response rate.

geopolitical zones, inclusive of the North West and South West where Kaduna and Lagos are located, respectively. In the four zones where there were

The number of women per household varied by state, per the 2013 Nigeria DHS (Table 4). Given the very low mCPR in Kano and Taraba, very few clusters were needed. The EA sample, however, was further expanded in three states, Kano, Taraba and Anambra. This was in anticipation of potential increase in the mCPR and sample power constraints to monitor its level in later years. Thus, a total of 302 EA clusters were included in Round 3.

TABLE 4 REQUIRED SAMPLE SIZES OF WOMEN, HOUSEHOLDS AND EA CLUSTERS AT STATE LEVEL

| State (Zone) | Required | | | | Implemented |
|---|---|---|---|---|---|
| | Number of women | Estimated WRA/HH[a] | Number of HHs | Number of EA clusters | Number of EA clusters |
| Anambra (SE) | 929 | 1.02 | 910 | 27 | 41 |
| Kano (NW) | 364 | 1.25 | 292 | 9 | 36 |
| Nasarawa (NC) | 1541 | 1.10 | 1401 | 41 | 40 |
| Rivers (SS) | 1487 | 0.85 | 1750 | 50 | 47 |
| Taraba (NE) | 571 | 1.36 | 420 | 12 | 20 |

[a] Source: 2013 Nigeria DHS

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As noted earlier, the EA clusters are selected with probability proportional to size using the master sampling frame – and when relevant stratified by urban-

Additionally, in the North West zone, we adjusted the sample distribution of Kaduna and Kano within the zone to reflect the relative population size of each state. We assumed that Kano and Kaduna we