

# Resilient and Accelerated Scale-Up of Subcutaneously Administered Depot–Medroxyprogesterone Acetate in Nigeria (RASuDiN): A Mid-Line Study in COVID-19 Era

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**Background:** Injectable contraceptives are fast becoming the method of choice among women in sub-Saharan Africa (SSA). Specifically, the subcutaneously administered depot–medroxyprogesterone acetate (DMPA-SC) is gaining traction as a convenient, private and effective method to address unmet need for family planning (FP). The objective of this study was to determine the trend in DMPA-SC use in Nigeria.

**Methods:** Data was extracted from the National Health Management Information System (NHMIS) FP register on DMPA-SC uptake in public health facilities and through community-oriented resource providers (CORPS) in 10 Nigerian states. The linear trend model was adopted in data analysis based on lowest measure of dispersion and/or highest adjusted coefficient of determination ( $R^2$ ). The statistical significance was determined at 5%.

**Results:** There was an upward trend in the use of DMPA-SC among clients who received the service through health providers, CORPS and self-injection in the 10 project states over a period of 12 months (August 2019–July 2020). In addition, the linear trend model showed that for every unit increase in months, the average number of women expected to use DMPA-SC through health providers, CORPS and self-injection will increase by 1308.3 ( $Y_t = 3799.7 + 1308.3*t$ ), 756.73 ( $Y_t = -1030.8 + 756.73*t$ ) and 77.864 ( $Y_t = -159.7 + 77.864*t$ ) respectively. In all models, the adjusted coefficient of determination was 99.9% which showed good model fitness. The results also showed that the number of DMPA-SC clients varied across the project states with Niger (32,988) and Oyo (31,511) states reporting the highest number of clients over the period of 12 months.

**Conclusion:** There was an increasing use of DMPA-SC and self-injection among clients over time. Health facility and community-based FP programs should be strengthened to ensure improved access to FP services.

**Keywords:** family planning, contraceptive, Nigeria, DMPA-SC, self-injection, birth control

## Introduction

Family planning (FP) has age-long benefits in maternal and infant mortality reduction.<sup>1</sup> In resource-poor settings, 214 million women of childbearing age had an unmet need for FP.<sup>2</sup> Though the FP2020 global partnership set an ambitious goal to reach more than half of these women with voluntary FP,<sup>3</sup> yet achieving this goal was practically impossible. Many factors have continued to hamper contraceptive use, such as: experiences of side effects, cost, method dissatisfaction, convenience, limited method options and intimate partner disapproval.<sup>4,5</sup> In addition, home,

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community and health institutions structure have placed limits on women's ability to take fertility control decision. For example, cultural, normative, societal and financial concerns as well as the requirement for partner's permission to access services, religious leaders' subtle and overt pushes to employ traditional FP methods, and out-of-pocket costs are major barriers.<sup>5</sup>

In Nigeria, the prevalence of modern contraceptive use was 14.2%.<sup>6</sup> According to Nigeria Demographic and Health Survey (NDHS), the use of modern contraceptive method was higher among sexually active unmarried women (28%) than among married women (12%). Among currently married women, the prevalence of contraception, regardless of method, was 17%.<sup>7</sup> In the five years prior to the survey, two out of every five women (41%) who started using a contraceptive method stopped within a year, indicating large discontinuation rate. While the desire to become pregnant was the most common reason for discontinuance (35%). Sexually active unmarried women had a larger unmet need for FP (48%) than currently married women (19%).<sup>7</sup>

Considering the challenges in achieving global, regional, national and sub-national contraceptive use targets, adding another voluntary contraceptive option to the method mix will help women to properly time and space their pregnancies for the healthiest and safest outcomes. Subcutaneously administered depot-medroxyprogesterone acetate (DMPA-SC) is a contraceptive injectable formulation that provides women with another voluntary FP option.<sup>8</sup> It offers favourable characteristics such as cost and time savings. It has the potential not only to be administered by a range of health care cadres, but can be self-injected.

The Government of Nigeria pledged to achieve modern contraceptive prevalence rate (mCPR) target of 27% by 2020.<sup>9</sup> To accelerate the progress toward that goal, DMPA-SC (brand name Sayana Press) was introduced to the contraceptive method mix in 2015.<sup>10</sup> DMPA-SC is seen as a valuable innovation in FP. Compared with other contraceptive methods, the benefits of DMPA-SC include ease of use, few side effects, quick administration, less pain and greater effectiveness.<sup>10–13</sup> Injectable contraceptives are increasingly popular in Nigeria (as many other African countries) due to their effectiveness, privacy and convenience.<sup>14</sup> DMPA-SC has been paired with an all-in-one syringe (Uniject),<sup>13</sup> creating a single, easy-to-use and acceptable product.<sup>15,16</sup> It has been heralded as a possible “game changer” for FP, due to its easy

administration by paraprofessionals like junior community health extension workers, community-based distributors, proprietary and patent medical vendors (PPMVs), or by self-injection.<sup>13</sup>

This study is being conducted in coronavirus disease 2019 (COVID-19) era. The first case of COVID-19 was reported in Wuhan, China, on December 8, 2019.<sup>17</sup> On December 31, 2019, Chinese health authorities contacted the World Health Organization (WHO), which declared the outbreak a Public Health Emergency of International Concern by January 30, 2020.<sup>18</sup> Due to its high spread and mortality across many countries, COVID-19 was declared a pandemic on March 11, 2020.<sup>19</sup> The impact of COVID-19 on sexual and reproductive health was worrisome.<sup>20</sup> The lack of contraceptive drugs and devices as a result of supply chain disruption was one of the most significant impediments to access.<sup>21</sup> In Nigeria, clients were hesitant to visit health facilities for FP commodity uptake. Interestingly, the implementation of resilient and accelerated scale-up of DMPA-SC in Nigeria (RASuDiN) coincided within the COVID-19 era. The project has a community component used to reach clients who are unwilling or unable to visit health facilities due to COVID-19. Also, it was crucial in expanding FP method choice, an indication of the potential for contraceptive use and scale-up in Nigeria. The objective of this study was to examine the trend in DMPA-SC use across selected Nigerian states.

## Methods

### Study Context

The study location is Nigeria, the most populous country in Africa with a population of 191 million.<sup>22</sup> Nigeria has a weak health delivery system that contributes to adverse maternal health outcomes,<sup>23,24</sup> including failure in birth control programs. Moreover, the health delivery system in Nigeria is grossly underfunded.<sup>25</sup> The national indices of maternal health, particularly in the use of vital health-care services is among the poorest in the world.<sup>26</sup> In the 5 years preceding the 2018 Nigeria Demographic and Health Survey (NDHS), modern contraceptive use was about 28% among sexually active unmarried women and 12% among currently married women. The unmet need for FP was 48% among sexually active unmarried women and 19% among currently married women.<sup>7</sup> These show that the use of contraceptive methods was low, worrisome and needs improvement.

To achieve the 27% mCPR, the Nigerian government developed; a) National Communication Plan (2017–2020); b) national guideline and training manuals for the introduction and scale-up of DMPA-SC self-injection (2019); c) manual for the Training of Doctors, Nurse/Midwives and Community Health Extension Workers on Postpartum Family Planning (2016); and d) task shifting/task sharing policy for essential health care services in Nigeria as well as the standard of practice (SOP). The implementation of these programs could in no small measure enhance contraceptive use in Nigeria. In 2017, the Federal Ministry of Health led the development of the Strategic Plan for DMPA-SC introduction and scale-up, a roadmap for expanding access and accelerating progress toward Nigeria's National FP blueprint (scale-up plan). As part of the strategic plan development process, the ministry – with technical support from the Health Policy Plus project (funded by the US Agency for International Development) and the Technical Support Unit project (funded by the Bill & Melinda Gates Foundation) – applied a new DMPA-SC Impact Model to quantify the potential FP programmatic impact and cost implications of DMPA-SC introduction and scale-up in Nigeria by 2021.

## Study Design

We used time series data collected retrospectively from health clinic encounter between August 2019 and July 2020 across the RASuDiN project states. The National Health Management Information System (NHMIS) FP Register was used to capture client information at the health facilities. The data was extracted over a period of 12 months to determine the trend of DMPA-SC uptake in public health facilities in Anambra, Delta, Enugu, Kwara, Lagos, Niger,

Ogun, Oyo, Plateau and Rivers states. Association of Reproductive and Family Health (ARFH) is the principal recipient of the grant and manages the project data.

## Project Description

In 2016, the Federal Ministry of Health, Nigeria authorized the introduction of DMPA-SC in health facilities. Nurses and midwives administered DMPA-SC at health facilities, adding to their routine FP service provision. In the commencement of the RASuDiN project in 2018, healthcare service providers and community-oriented resource providers (CORPS) were trained on DMPA-SC. This was similar to a previous approach where community health workers and facility-based health care providers in Benin were trained to administer DMPA-SC safely and effectively in 10 health zones.<sup>27</sup> Community-based DMPA-SC service delivery is becoming popular, particularly among new users of contraception and could help the country achieve its FP goals. [Table 1](#) has the details of the project Nigerian states, number of Local Government Areas (LGAs) per state and the number of public health facilities (primary, secondary and tertiary) in each state.

## Data Collection and Reporting Approach

The data was collected across all intervention health facilities in the 10 RASuDiN project states (Anambra, Delta, Enugu, Kwara, Lagos, Niger, Ogun, Oyo, Plateau and Rivers). These include both those reporting on District Health Information System (DHIS) or otherwise. At community level, each CORPs on the RASuDiN project was attached to a health facility where their service delivery data are entered into the NHMIS FP register. The facility FP providers in turn collates the entire data (both health

**Table 1** Study Sites of RASuDiN Project

State	Number of Local Government Areas	Number of health facilities			
		Primary Health Care	Secondary	Tertiary	Total health Facilities
Anambra	21	531	36	2	569
Delta	25	449	62	2	513
Enugu	17	456	54	4	514
Kwara	16	514	35	1	550
Lagos	20	290	25	4	319
Niger	25	1146	22	2	1170
Ogun	20	477	29	3	509
Oyo	33	712	46	2	760
Plateau	17	713	19	2	734
Rivers	23	363	27	5	395
<b>Total</b>	<b>217</b>	<b>5651</b>	<b>355</b>	<b>27</b>	<b>6033</b>

facility and CORPs contributions) and transmit it to the Local Government Area (LGA) Reproductive Health (RH)/FP supervisor who in turn sends it to the LGA Monitoring and Evaluation (M&E) officer for upload on the National DHIS2 platform after quality control checks. Data is transmitted by the facility FP provider to the LGA RH/FP coordinator every month.

Health facilities from each state conduct data collation and validation review meetings before reporting on the DHIS instance. Similarly, the LGA RH/FP supervisors conduct monthly review meetings with CORPs to collate and validate community-level service delivery at the health facilities where they are linked before transmission to the LGA M&E officers. Data recorded in the NHMIS FP register is verified against data recorded in the Monthly Summary Form, Referral Forms and the CORPs Data Entry Form. The LGA M&E Officers transmit the data to the National DHIS system. The LGA RH/FP supervisors conduct monthly review meetings with CORPs in all the 217 LGAs in the 10 implementing project states. The supervisors also ensure completeness and timely submission of monthly reports.

## Outcome Variable

The new acceptors and revisits for DMPA-SC (health facility provider-administered, CORPS-administered and self-injection) were measured in the 10 RASuDiN project states (Anambra, Delta, Enugu, Kwara, Lagos, Niger, Ogun, Oyo, Plateau and Rivers). In addition, the number of health clinics providing DMPA-SC for each month was determined across the project states.

## Ethical Approval

Ethical approval was obtained from National Health Research Ethics Committee (NHREC) of Nigeria – Protocol approval number: NHREC/01/01/2007-17/10/2018. In addition, permission was obtained from individual State Ministry of Health to conduct the research.

## Statistical Analysis

The total number of clients who received DMPA-SC through health facility staff, CORPS and self-injection were summarized in counts. Time series analysis approach was used to determine the trend of DMPA-SC uptake over a 12-month period; August 2019 through July 2020. The linear trend model was adopted due to lowest measure of dispersion and/or highest adjusted coefficient of determination ( $R^2$ ). This

approach follows the method adopted by previous authors.<sup>28</sup> Statistical significance was determined at 5%. Data analysis was conducted using Minitab version 17.0. Minitab provides user-friendly approach for time series modeling and forecasting. It provides several statistical models, and graphical tools that make results on time series analysis simpler.

## Results

### Trend Analysis for Health Facility Providers', CORPS-Administered and Self-Injection DMPA-SC Clients

In [Figure 1](#), the use of DMPA-SC showed an upward trend among clients who received the service through health facility staff in the 10 RASuDiN project states over a period of 12 months (August 2019 – July 2020). See [Figure 1](#) below for the details.

[Table 2](#) showed the reported number of facility clients, the predicted number of facility clients and the residual. Based on the linear trend model ( $Y_t = 3799.7 + 1308.3*t$ ), for every unit increase in months, the average number of women expected to receive DMPA-SC will increase by 1308.3. The adjusted coefficient of determination was 99.9% which showed very good model fitness.

Linear Trend Equation:  $Y_t = 3799.7 + 1308.3*t$ .

Adjusted  $R^2 = 99.9\%$ .

Based on [Figure 2](#) results, there was an upward trend in the use of DMPA-SC among clients who received the service through CORPS in the 10 RASuDiN project states over a period of 12 months (August 2019 – July 2020). See [Figure 2](#) for the details.

The results showed reported number of CORPS clients, the predicted number of CORPS clients and the residual. Based on the linear trend model ( $Y_t = -1030.8 + 756.73*t$ ), for every unit increase in months, the average number of women expected to received DMPA-SC through CORPS will increase by 756.73. The adjusted coefficient of determination was 99.9% which showed very good model fitness. See [Table 3](#) for the details.

Linear Trend Equation:  $Y_t = -1030.8 + 756.73*t$ .

Adjusted  $R^2 = 99.9\%$ .

[Figure 3](#) showed the use of DMPA-SC had an upward trend among clients who self-injected in the 10 RASuDiN project states over a period of 12 months (August 2019 – July 2020). See [Figure 3](#) below for the details.

In [Table 4](#), we presented the reported number of self-injection clients, the predicted number of self-injection

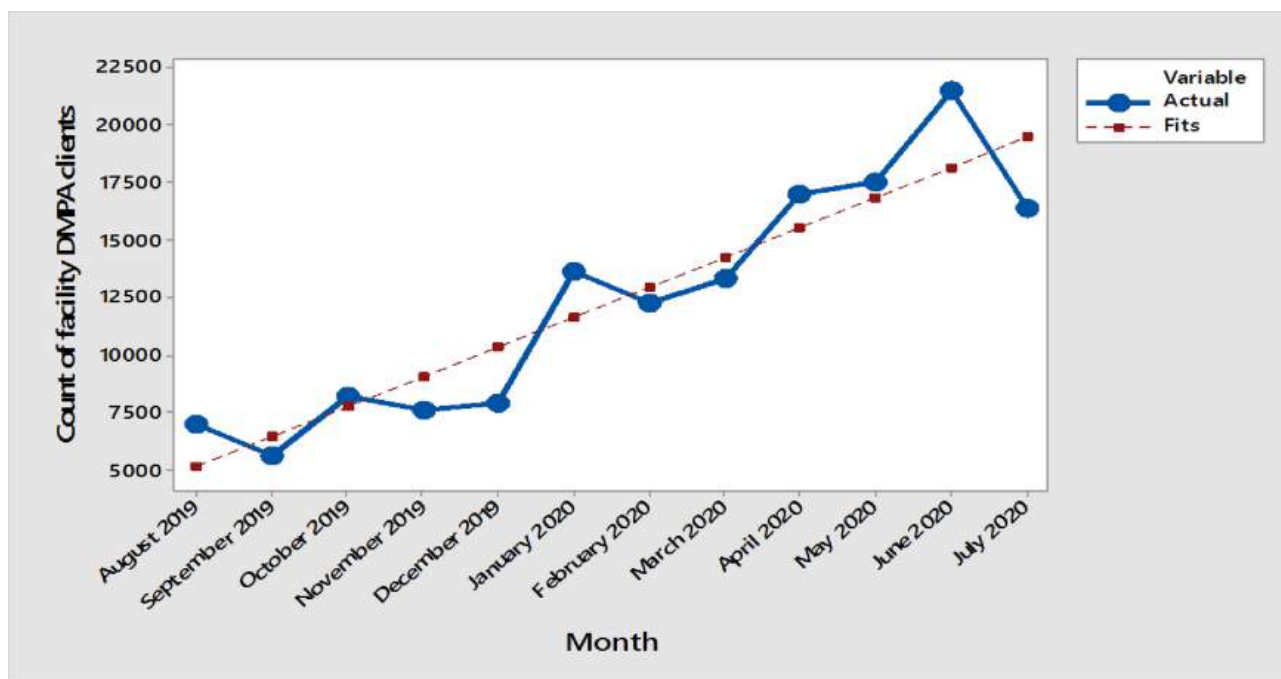


Figure 1 Count of DMPA-SC clients who received the method through health facility providers.

clients and the residual. Based on the linear trend model ( $Y_t = -159.7 + 77.864*t$ ), for every unit increase in months, the average number of women expected to receive DMPA-SC will increase by 77.864. The adjusted coefficient of determination was 99.9% which showed very good model fitness.

Linear Trend Equation:  $Y_t = -159.7 + 77.864*t$ .  
Adjusted  $R^2 = 99.9\%$ .

Table 2 Time Series Analysis of DMPA-SC Clients Who Received the Method Through Health Facility Providers

Month	Reported Number of Facility Clients	Predicted Number of Facility Clients	Residual
August 2019	6964	5107.95	1856.05
September 2019	5586	6416.20	-830.20
October 2019	8157	7724.45	432.55
November 2019	7561	9032.70	-1471.70
December 2019	7855	10,340.96	-2485.96
January 2020	13,601	11,649.21	1951.79
February 2020	12,237	12,957.46	-720.46
March 2020	13,337	14,265.71	-928.71
April 2020	16,983	15,573.96	1409.04
May 2020	17,505	16,882.21	622.79
June 2020	21,492	18,190.47	3301.53
July 2020	16,362	19,498.72	-3136.72

### Service Delivery Points Providing DMPA-SC in RASuDiN Project States; August 2019–July 2020

In Table 5, the number of DMPA-SC delivery points were summarized in counts across project states and over time (August 2019 through July 2020). The total number of service delivery points was highest in Delta State (n= 4583), followed by Enugu State (n= 4086) and Oyo State (n= 4006). However, Plateau State had the least service delivery points (n= 864). The total number of service delivery points across the ten project states was 30,797. Notably, the number of DMPA-SC delivery points which reported data increased over time from August 2019 to July 2020. See Table 5 for the details.

### Utilization of DMPA-SC in Nigeria Across Project States for 12 Months

In Table 6, we showed the number of new acceptors and revisits of DMPA-SC clients who received the method through health facility staff and CORPS respectively, across RASuDiN project states and over a period of 12 months (August 2019 – July 2020). In addition, we presented the total number of clients (new acceptors and revisits) who received DMPA-SC across RASuDiN project states and over 12 months. In sum, the number of clients who received DMPA-SC increased as time increases. The

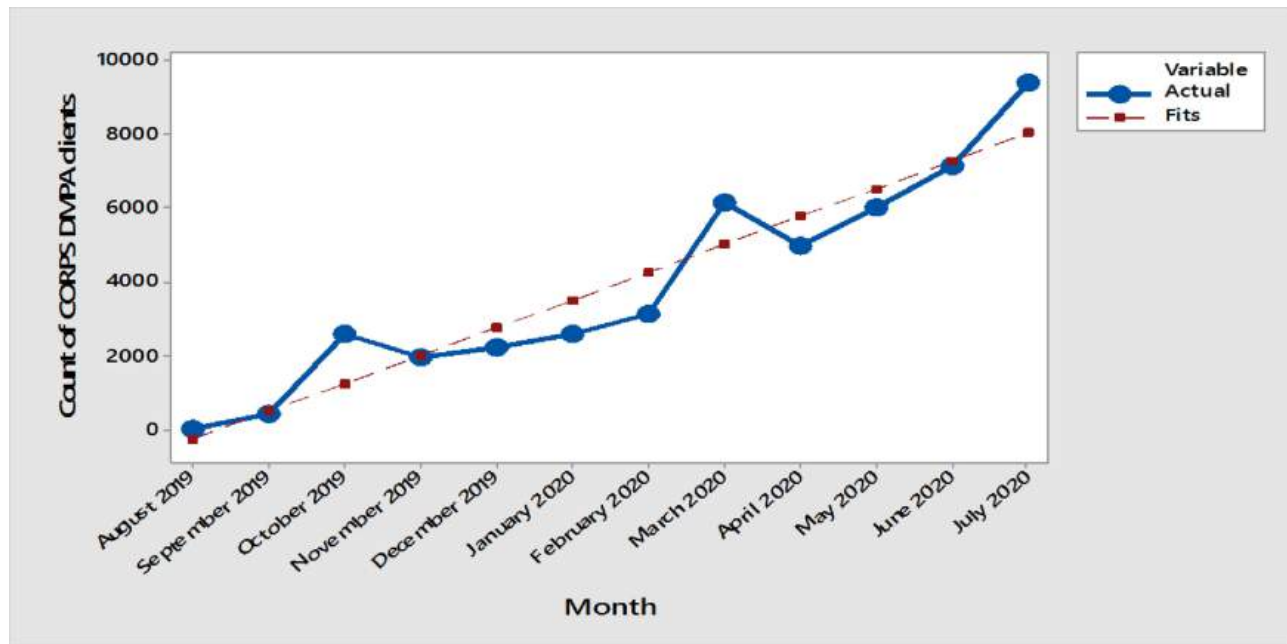


Figure 2 Count of DMPA-SC clients who received the method through CORPS.

results also showed that the number of DMPA-SC clients varied across the project states with Niger (32,988) and Oyo (31,511) states reporting the highest number of clients. See Table 6 for the details.

### Discussion

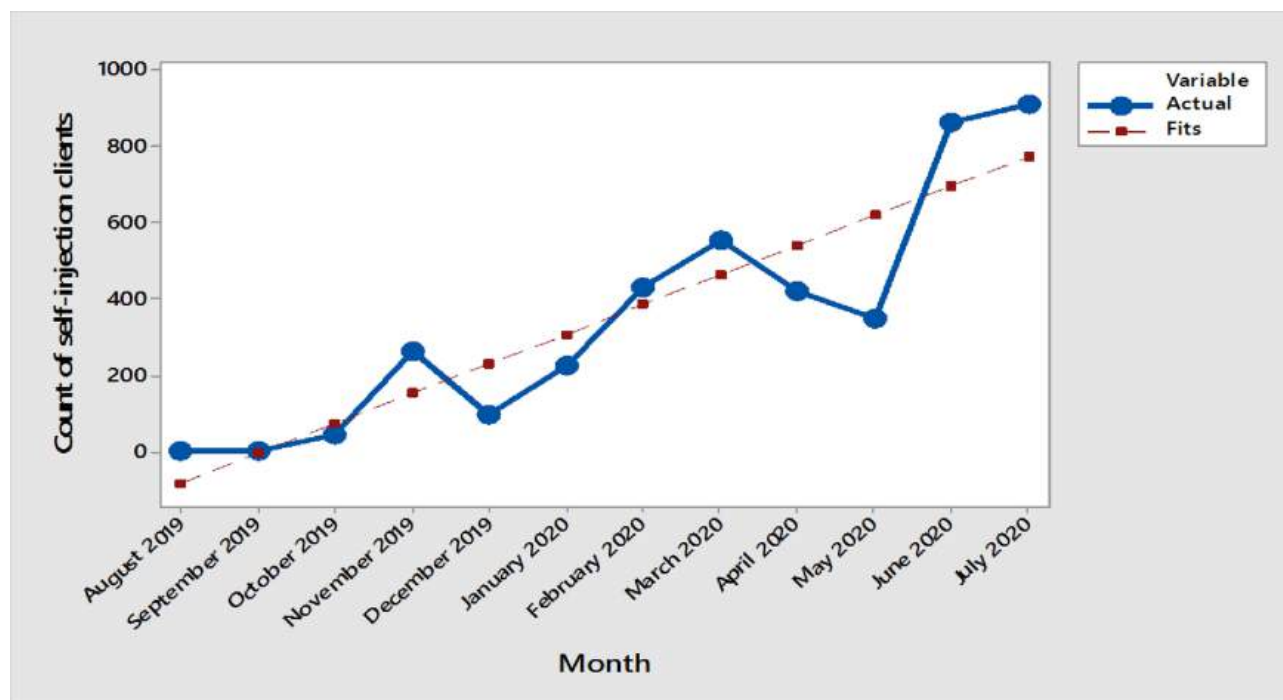
To the best of our knowledge, this is the foremost study to measure the trend of provider-administered and self-injection of DMPA-SC in Nigeria. The results showed an

upward trend in the use of DMPA-SC across the project states. This initial success of the RASuDiN project shows promise to help in the contribution to meet the country’s FP commitment. After 12 months of implementation, the RASuDiN project seems to hold a greater promise by reaching about 194,295 women in 10 Nigerian states. In previous studies, all countries experienced a sizeable increase in the use of DMPA. About 7,997 women chose DMPA-SC after 13 months of implementation in the Republic of Benin.<sup>27</sup> Approximately 14,273 units of DMPA-SC provided by Reproductive Health Uganda clinics, mobile outreach teams and village health teams over a period of 12 months were utilized.<sup>8</sup> Furthermore, in the results from pilot introduction of DMPA-SC in 4 African countries to expand the range of contraceptive methods available to women, Niger reported 43,801, Senegal reported 120,861, Uganda reported 130,673 and Burkina Faso reported 194,695 DMPA-SC users over a period of 12 months.<sup>29</sup> The increased uptake of DMPA has been consistent in various African countries.

The findings of this study is evidence that the Strategic Plan for the introduction and scale-up of DMPA-SC by the Federal Ministry of Health to fully scale-up DMPA-SC across all 36 Nigerian states and the Federal Capital Territory by 2021 may have already been operationalized in the study locations. The plan was to ensure that all eligible providers across public and private sectors are trained on DMPA-SC service provision,

Table 3 Time Series Analysis of DMPA-SC Clients Who Received the Method Through CORPS

Month	Reported Number of CORPS Clients	Predicted Number of CORPS Clients	Residual
August 2019	0	-274.10	274.10
September 2019	404	482.63	-78.63
October 2019	2583	1239.56	1343.64
November 2019	1948	1996.09	-48.09
December 2019	2228	2752.82	-524.82
January 2020	2581	3509.55	-928.55
February 2020	3109	4266.28	-1157.28
March 2020	6179	5023.01	1155.99
April 2020	4974	5779.74	-805.74
May 2020	6043	6536.47	-493.47
June 2020	7168	7293.21	-125.21
July 2020	9438	8049.94	1388.06



**Figure 3** Count of DMPA-SC clients who can self-inject.

counselling and self-injection. Moreover, the village health workers are to serve as public sector community-level providers of DMPA-SC, pharmacies and Patent and Proprietary Medicine Vendors (PPMVs) would be able to legally stock and administer DMPA-SC and the junior community health extension workers would provide the service too.<sup>30</sup> The findings are consistent with the results of previous studies which found an upward trend in modern contraceptive use over time especially among young women.<sup>31,32</sup>

**Table 4** Time Series Analysis of DMPA-SC Self-Injection Clients

Month	Reported Number of Self-Injection	Predicted Number of Self-Injection	Residual
August 2019	1	-83.83	82.83
September 2019	1	-3.97	4.97
October 2019	42	73.89	-31.89
November 2019	264	151.76	112.24
December 2019	97	229.62	-132.62
January 2020	223	307.48	-84.48
February 2020	431	385.35	45.65
March 2020	555	463.21	91.79
April 2020	421	541.08	-120.08
May 2020	350	618.94	-268.94
June 2020	863	696.80	166.20
July 2020	909	774.67	134.33

The upward trend could be due to changes in contraceptive use behaviour through increased awareness creation. In a previous study, about two-thirds of the increase in modern contraceptive use was due to change in contraceptive use behaviour.<sup>33</sup> Most importantly, the increased number of clients over time could be due to the changes in contraceptive use behaviour among the rural population and among religious women as a result of gatekeepers' buy-in for the project.<sup>31</sup> Decision makers or gatekeepers involvement in FP could be a major motivator for women's uptake of contraceptive.<sup>33</sup> In our project, DMPA-SC is only a method mix to other FP commodities and clients are able to make their choice. A previous study on DMPA-SC in Nigeria reported many users choose DMPA-SC due to recommendations from providers and friends, and the experience of less side effects.<sup>34</sup> Proper counselling is a determining factor for contraceptive methods use in general and DMPA-SC uptake in particular.<sup>10</sup> In RASuDiN project, clinicians/nurses and CORPS conduct counselling at health facilities and at communities as directed in national guideline.

Another possible reason for the upward trend could be the availability of commodities across the project states. Since the DMPA-SC introductory program in Nigeria, distribution of commodity has been amplified especially to high volume providers and high demand settings.<sup>34</sup>

**Table 5** Number of Service Delivery Points Providing DMPA-SC in RASuDIN Project States, Nigeria; August 2019–July 2020

State	August 2019	September 2019	October 2019	November 2019	December 2019	January 2020	February 2020	March 2020	April 2020	May 2020	June 2020	July 2020	Total
Anambra	224	221	141	574	574	628	-	-	628	628	181	79	3878
Delta	405	394	420	420	420	420	420	420	420	420	424	-	4583
Enugu	308	45	368	301	301	482	442	362	402	406	501	168	4086
Kwara	128	36	165	174	169	94	251	94	336	350	322	320	2339
Lagos	128	157	207	181	173	257	252	252	252	252	253	305	2669
Niger	-	-	-	-	-	403	465	515	472	493	614	547	3509
Ogun	198	158	-	229	-	57	209	57	239	307	469	246	2169
Oyo	309	125	420	420	403	372	-	403	370	359	466	359	4006
Plateau	-	-	136	-	-	136	136	-	100	86	135	135	864
Rivers	70	325	148	157	325	325	325	180	188	185	272	194	2694
<b>Total</b>	<b>1770</b>	<b>1461</b>	<b>2005</b>	<b>2456</b>	<b>2365</b>	<b>3174</b>	<b>2400</b>	<b>2283</b>	<b>3407</b>	<b>3486</b>	<b>3637</b>	<b>2353</b>	<b>30,797</b>

Moreover, community-based distribution has been an effective service delivery model for the hard-to-reach, most-at-risk of unmet need for FP and the key population such as the young and unmarried users. Women who are motivated to uptake contraceptive use for reasons such as benefits of a method, economic situation, suitability of a methods and fear of unwanted pregnancy, now have DMPA-SC available, assessable and without fee.<sup>33</sup> No doubt, the availability, accessibility and free commodity/ service for DMPA-SC may have contributed to the upward trend.

There are many unintended pregnancies in Nigeria,<sup>35</sup> which seems to indicate a large unmet need for contraceptive use.<sup>36</sup> However, the myth and misconception about the side effects of modern contraceptives,<sup>37</sup> may have contributed to low contraceptive use. Moreover, what was lacking was the political will to implement FP programs on a much larger scale, using community-oriented approaches and communication programs, to help change the myth about the side effects of modern contraceptives. But it seems the Nigerian government has arisen to her responsibility recently. This is why DMPA-SC is becoming the game changer in the FP method mix. DMPA-SC is safe with minimal side-effects. In a longitudinal study in Nigeria, 810 clients who used DMPA as a contraceptive method were followed over a period of 11 years. In the end, amenorrhea, weight gain, weight loss, metrorrhagia and menorrhagia were the reasons for discontinuation of DMPA in only 11% of the patients.<sup>38</sup>

### Strengths and Limitations

The total saturation approach in the implementation of RASuDIN project makes a plausible representation of the project states. The participation of key stakeholders during the monthly data validation meetings and the measures of data validation, make the results of this study very dependable. However, our sample of DMPA-SC users in 10 out of 36 states + Federal Capital Territory in Nigeria is unlikely to be representative of the Nigerian population of reproductive age women. These data would not be considered representative, as there is no denominator to determine the rate. The data consist of counts of patient encounters. Further, because this analysis is restricted to service data, client motivations for using family planning for the first time or choosing to switch to DMPA-SC from another method cannot be determined. It is possible that increase in the use of DMPA-SC may have been overestimated due to the use of absolute count rather than a rate.



**Table 6** Utilization of DMPA-SC in RASuDIN Project States, Nigeria; August 2019–July 2020

State	August 2019	September 2019	October 2019	November 2019	December 2019	January 2020	February 2020	March 2020	April 2020	May 2020	June 2020	July 2020	Total
<b>Number of new acceptor of DMPA-SC provided by health facility staff across project states for 12 months</b>													
Anambra	408	352	261	173	173	467	443	360	373	560	622	622	4814
Delta	363	511	366	414	525	618	444	885	855	844	1481	-	7306
Enugu	552	190	750	574	578	622	706	650	1573	464	1379	789	8827
Kwara	342	86	317	364	358	115	220	664	470	737	791	897	5361
Lagos	529	667	673	835	611	1006	1031	775	384	384	692	692	8279
Niger	-	-	-	-	-	2855	2504	2902	2618	2533	3129	5089	21,630
Ogun	490	358	262	528	563	605	530	427	615	892	1101	-	6371
Oyo	1176	474	991	693	649	689	469	498	1798	1819	1829	965	12,050
Plateau	364	289	288	175	178	141	205	287	287	351	625	126	3316
Rivers	366	547	848	700	616	722	515	363	468	521	405	398	6469
<b>Total</b>	<b>4590</b>	<b>3474</b>	<b>4756</b>	<b>4456</b>	<b>4251</b>	<b>7840</b>	<b>7067</b>	<b>7811</b>	<b>9441</b>	<b>9105</b>	<b>12,054</b>	<b>9578</b>	<b>84,423</b>
<b>Number of new acceptor of DMPA-SC provided by CORPS across project states for 12 months</b>													
Anambra	-	-	117	344	364	283	294	364	379	453	466	555	3619
Delta	-	-	-	-	287	241	-	396	192	482	630	-	2228
Enugu	-	-	-	-	-	222	210	406	259	264	289	306	1956
Kwara	-	-	202	-	130	-	140	206	160	192	262	139	1431
Lagos	-	-	370	250	167	233	210	999	136	144	255	352	3116
Niger	-	-	-	-	-	-	-	-	-	-	-	2215	2215
Ogun	-	-	246	128	-	233	83	259	298	353	511	502	2613
Oyo	-	-	253	179	179	120	118	428	55	756	900	994	4485
Plateau	-	-	99	131	131	222	310	270	303	395	466	524	2851
Rivers	-	404	463	326	236	178	220	302	244	287	247	315	3222
<b>Total</b>	<b>-</b>	<b>404</b>	<b>1750</b>	<b>1358</b>	<b>1494</b>	<b>1732</b>	<b>1585</b>	<b>3630</b>	<b>2529</b>	<b>3326</b>	<b>4026</b>	<b>5902</b>	<b>27,736</b>
<b>Number of revisits of DMPA-SC provided by health facility staff across project states for 12 months</b>													
Anambra	169	237	420	134	134	313	329	326	380	367	424	318	3551
Delta	239	306	301	322	275	527	389	693	642	766	1106	-	5566
Enugu	68	65	430	39	89	190	120	256	597	231	392	415	2892
Kwara	231	44	360	277	259	66	266	634	690	863	878	955	5523
Lagos	481	408	677	738	824	1111	1111	276	1001	1001	1204	973	9805
Niger	-	-	-	-	-	1092	859	1123	995	1007	1649	1935	8660
Ogun	436	442	268	419	450	735	793	674	727	930	999	-	6873
Oyo	452	239	450	693	740	785	533	548	1515	2090	1770	1246	11,061
Plateau	193	121	164	168	153	128	187	282	294	376	409	255	2730
Rivers	105	250	331	315	680	814	583	714	701	769	607	687	6556
<b>Total</b>	<b>2374</b>	<b>2112</b>	<b>3401</b>	<b>3105</b>	<b>3604</b>	<b>5761</b>	<b>5170</b>	<b>5526</b>	<b>7542</b>	<b>8400</b>	<b>9438</b>	<b>6784</b>	<b>63,217</b>

(Continued)

Table 6 (Continued).

State	August 2019	September 2019	October 2019	November 2019	December 2019	January 2020	February 2020	March 2020	April 2020	May 2020	June 2020	July 2020	Total
Number of revisits of DMPA-SC provided by CORPS across project states for 12 months													
Anambra	-	-	9	42	72	168	231	309	345	293	394	401	2264
Delta	-	-	-	-	15	3	-	251	51	188	282	-	790
Enugu	-	-	-	-	-	30	30	136	189	183	238	276	1082
Kwara	-	-	316	-	119	-	193	203	236	283	233	123	1706
Lagos	-	-	146	250	91	-	322	312	288	299	447	416	2571
Niger	-	-	-	-	-	-	-	-	-	-	-	483	483
Ogun	-	-	180	92	-	102	170	169	207	203	346	371	1840
Oyo	-	-	156	144	144	165	161	423	573	687	700	762	3915
Plateau	-	-	26	62	62	151	176	262	269	290	244	330	1872
Rivers	-	-	-	-	231	230	241	484	287	291	258	374	2396
<b>Total</b>	-	-	833	590	734	849	1524	2549	2445	2717	3142	3536	18,919
Total number of clients who utilized DMPA-SC across project states for 12 months													
Anambra	577	589	807	693	743	1231	1297	1359	1477	1673	1906	1896	14,248
Delta	602	817	667	736	1102	1389	833	2225	1740	2280	3499	-	15,890
Enugu	620	255	1180	613	667	1064	1066	1448	2618	1142	2298	1786	14,757
Kwara	573	130	1195	641	866	181	819	1707	1556	2075	2164	2114	14,021
Lagos	1010	1075	1866	2073	1693	2350	2674	2362	1809	1828	2598	2433	23,771
Niger	-	-	-	-	-	3947	3363	4025	3613	3540	4778	9722	32,988
Ogun	926	800	956	1167	1013	1675	1576	1529	1847	2378	2957	873	17,697
Oyo	1628	713	1850	1709	1712	1759	1281	1897	4444	5352	5199	3967	31,511
Plateau	557	410	577	536	524	642	878	1101	1153	1412	1744	1235	10,769
Rivers	471	1201	1642	1341	1763	1944	1559	1863	1700	1868	1517	1774	18,643
<b>Total</b>	6964	5990	10,740	9509	10,083	16,182	15,346	19,516	21,957	23,548	28,660	25,800	194,295

## Conclusion

We have found an increasing number of women adopting and continuing to utilize DMPA-SC as a form of birth control in Nigeria. While there is a large focus on the uptake and continuation of DMPA-SC, more concerted efforts are needed to scale-up the intervention to other parts of Nigeria. More women can be encouraged to uptake or continue contraceptive use. We recommend that attention should be paid to improving the quality of counseling about side effects of contraceptive use, and particularly those related to amenorrhea, weight gain, weight loss, metrorrhagia, menorrhagia and bleeding as to enhance universal acceptability of contraceptive use in Nigeria.

## Abbreviations

AIDS, Acquired Immunodeficiency Syndrome; ARFH, Association for Reproductive and Family Health; CORPS, Community Oriented Resource Persons; COVID-19, Coronavirus disease 2019; DHIS, District Health Information System; DMPA-SC, Subcutaneously-administered Depot-medroxyprogesterone acetate; FP, Family Planning; LGA, Local Government Area; M&E, Monitoring and Evaluation; MMR, Maternal Mortality Ratio; NDHS, Nigeria Demographic and Health Survey; NHREC, National Health Research Ethics Committee; PPMVs, Patent and Proprietary Medicine Vendor; RASUDIN, Resilient and Accelerated Scale Up of Subcutaneously-administered Depot-medroxyprogesterone Acetate in Nigeria; RH, Reproductive Health; SBC, Social and Behaviour Change; SDG, Sustainable Development Goal; WHO, World Health Organization.

## Data Sharing Statement

Data is available strictly on request.

## Ethics Approval and Consent to Participate

Ethical clearance was obtained from the National Health Research Ethics Committee, Nigeria for research in the RASuDiN project.

## Consent for Publication

No consent to publish was needed for this study as the authors did not use any details, images or videos related to individual participants.

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## Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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## Disclosure

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