





were calculated using Chi-square. An initial frequency count of all variables was done and represented in tables. The mean and ranges of all the variables were calculated. The level of significance was set at  $P \leq 0.05$ .

## Results

Out of 972 children who are within 1 year who are residents in this health center in 2012, 63% (613/972) were immunized for DPT3 while 63.7% (619/972) were immunized for DPT1. This gives an overall dropout rates and percentage of 6 and 1% (6/613) respectively.

Immunization coverage for 2012 was also stratified into intervals of 4 months: From January to April 2012, 168 children received DPT1 while 166 received DPT3. This gives a dropout rate and percent of 2 and 0.6% (2/166) respectively.

Between May and August 2012, 222 children received DPT1 while 226 received DPT3. Dropout rate and percentage of -4 and -1.8% (-4/222) were obtained respectively.

The last third of the year (September to December 2012) showed that 223 children received DPT1 while 227 received DPT3. This gave dropout rate and percentage of -4 and -1.8% (-4/223) were obtained respectively.

The average number of children immunized for DPT1 and DPT3 per month is 61.3 and 60.7 respectively. When immunization of DPT1 and DPT 3 were compared at 4 months intervals, the dropout rate is not statistically significant ( $P = 0.75$  and 95% confidence interval of 63 (1.86%) [Table 1].

Figure 1 shows a step lather increase in immunization coverage (using DPT) from January to December 2012.

## Discussion

Immunization coverage rate for DPT3 is the proportion of surviving infants who received three doses of DPT (diphtheria, pertussis and tetanus) vaccine before their first birthday. This study clearly depicts the level of immunization coverage in a rural setting in Nigeria. The 63% coverage obtained in this study is less than that (70%) obtained in a particular center in Nigeria.<sup>[3,12]</sup> The reason for this low value could probably be that the health facility is located in a rural area. Obstacles ranging from bad road conditions, concentration of health workers in cities and lack of extension of government immunization policies in the rural areas could explain this low coverage rates.

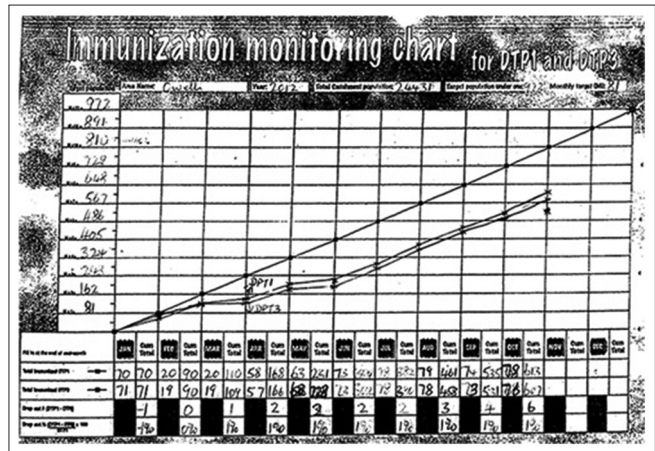
Painfully, the low values obtained in this study is even higher than that in two hospitals in northern Nigeria where coverage rates of 32% and 35% were obtained respectively.<sup>[9,13]</sup>

Reasons adduced for this low value varies from non-acceptance of immunization in the Northern area because

**Table 1: Immunization coverage using DPT**

Month	Population vaccinated (DPT1)	Population vaccinated (DPT3)	Dropout rate	Dropout (%)
January-April	168	166	2	1
May-August	222	226	-4	-1.8
September-December	223	227	-4	-1.8
Total	613	619	-6	-1

95% Confidence interval=63 (1.86),  $P=0.75$  (NB: The negative dropout rate showed a decline of coverage rate when compared with the positive dropout rate. It also means that those with negative dropout rate had a lower DPT1 coverage than DPT3). DPT1: Single dose of diphtheria-pertussis-tetanus, DPT3: Three doses of diphtheria-pertussis-tetanus



**Figure 1:** A graphical representation of immunization coverage rate over 1 year period

of religio-cultural beliefs. Other reasons for low coverage here could be resistance from parents. It was revealed that when parents resist vaccination, it is because they want to protect their children from harm.<sup>[14,15]</sup> In 2003, political and religious leaders in three Northern Nigerian states boycotted a WHO polio vaccination campaign, claiming that the vaccine caused sterility and acquired immunodeficiency syndrome.<sup>[16]</sup>

It is noted that in 1980, fewer than 10% of the world's children lived in 20 of the 167 countries with DTP3 coverage levels greater than 80%; 84% of the world's children lived in countries where coverage was less than 50%. By 1990, 108 countries (43% of all children) had DTP3 coverage levels greater than 80% and fewer than 10% of children lived in countries with under 50% coverage.

Immunization coverage levels can “mask” some rural areas where coverage is much lower as depicted in our study. For instance, in 2006, despite the 80% world DTP3 coverage; approximately 26.3 million children who reached their first birthday still did not receive DTP3 and 16.2 million (62%) of them lived in rural China, India, Indonesia or Nigeria.<sup>[17]</sup>

The dropout rates obtained in this study are very minimal. These low levels can be explained. It is seen that these villagers

live in clans and those who came for immunization are well communicated to, on the need to comply with subsequent immunization schedules. They use jingles, town crier, village square meetings to achieve these aims. As part of a complete immunization program, communication efforts should be totally linked to and complement the other immunization technical components, including the provision and quality of services, health worker capacity-building and skills and disease reporting and surveillance.<sup>[18]</sup> Communication activities that are sufficiently planned, funded and integrated with service delivery can help facilitate immunization program.<sup>[19,20]</sup> It has been documented that dropout rates are higher in studies carried in three states in Nigeria where rates higher than 10% were obtained.<sup>[3]</sup>

The WHO standard is that a dropout rate greater than 10% is unacceptable.<sup>[21,22]</sup> In none of these two hospitals from Northern states for which data are presented were dropout rates within that allowable maximum.<sup>[18]</sup> Indeed, an inspection of dropout rates from DPT1 to DPT3 is very vital to indicate coverage and compliance in a given area.<sup>[3]</sup>

Immunization coverage for children, in this study, improved in the last half of the year when compared to the first half. This could be due to the fact that the first half of the year is usually a farming season and as such a parents and care givers of these children will prefer giving more time for farm work to visit the health facility.

Finally, it is important to note that there is no significant difference between dropout rates for 2012 and part of 2013. This is a clarion call for the government to intensify efforts at reducing the dropout rates to the barest minimum. The dropout rate for both years however, is significant when compared with the 10% WHO standard.

Although childhood vaccination prevents 2 million deaths/year world-wide and is widely considered to be “overwhelmingly good” by the scientific community.<sup>[1]</sup> However, about 2.5 million deaths/year continue to be caused by vaccine-preventable diseases, mainly in Africa and Asia among children less than 5 years old.<sup>[1]</sup> Vaccination coverage is dwindling in many developing countries and even where good coverage has been attained, reaching children not yet vaccinated has proved difficult. There is an urgent need to increase vaccination coverage. It is also important to encourage parents to have their children vaccinated.

## Conclusion

Though the total immunization coverage in this rural health center is poor, they have a very low dropout rate.

## Limitation

Immunization coverage rates in all health centers in Awgu Local Government Area were not ascertained due to lack of good road network. This would have made this work better.

## Recommendation

This study goes to portend the need for the government to intensify effort to improve immunization coverage, especially in rural areas.

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