

# Immunisation and Its Adverse Effects: Experience of Mothers in South Western, Nigeria

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**Abstract**— Adverse events following immunisation (AEFI) is a critical component of the immunisation program. Serious or even non-serious adverse events following immunisation are often deemed unacceptable by vaccinees, parents and the general public, thus it has become increasingly important to pay attention to vaccine safety. It is vital to establish caregivers' perceptions on AEFI and how they influence their decisions to vaccinate children. This study is to assess caregivers' knowledge and practices on AEFI. This comparative qualitative study was carried out among household in rural and urban communities in Ekiti and Oyo States, southwestern Nigeria. A multi-stage sampling technique was used to select respondents and Focus Group Discussion (FGD) guide used to elicit information from the participants. Four sessions of FGDs were conducted with 37 participants. Data were analyzed using ATLAS ti version 7; and results were presented in tables and prose. Majority of the respondents were female, married, Yoruba tribe and are Christians. Majority of the respondents had tertiary education in the urban groups while more respondents without formal education are prevalent in the rural area. Knowledge level on AEFI was above average with fair practices of managing AEFI. There are different practices among the urban and rural communities.

**Keywords**— Adverse events, Immunisation, Vaccination.

## I. INTRODUCTION

Immunisation is one of the most successful and cost effective public health intervention of the 20<sup>th</sup> century in terms of number of deaths averted per year. In the developing world, it does not only prevent about 3million child deaths per year but also has the potential to avert additional 2 million deaths.<sup>2</sup> Adverse Event Following Immunisation (AEFI) is defined as 'a medical incident that takes place after immunisation, causes concern and is believed to be caused by the immunisation.'<sup>3</sup> AEFI is a critical component of the immunisation program. Serious or even non-serious adverse events following immunisation are often deemed unacceptable by vaccinees, parents and the general public.<sup>4</sup>

Vaccine preventable diseases are known to account for approximately 22% of child death in Nigeria, amounting to over 200,000 deaths per year.<sup>5</sup> Also, under-five mortality rate is estimated to be 120 per 1,000 live births – 1 in 9 live birth die before their fifth birthday.<sup>5</sup> While previous information about the importance of immunisation in controlling the spread of disease in Nigeria is valid, there is need for more understanding on whether knowledge and perception of caregivers on Adverse effects predict childhood immunisation rate.<sup>6</sup> It is important to conduct more studies on the Effects of Immunisation in the children from the mothers that are primarily involved in the child welfare and who are the most likely point of first contact when AEFI occur.

A study conducted on mothers' knowledge and perception on adverse events following immunisation in Enugu, south-

east Nigeria shows that a good number of the participants in the study had also heard about adverse events following immunisation. This knowledge was not related to maternal education.<sup>7</sup> This study further revealed that most mothers believed that immunisation should continue despite the occurrence of adverse events, and that suffering the adverse reactions were better than suffering the diseases. Some mothers erroneously believed that their children would not suffer the diseases even if not immunised.<sup>7</sup>

A study on survey of knowledge and reporting practices of Primary Health Care Workers on AEFI in Alimosho Local Government Area, Lagos shows nearly 80% of respondents had fair/good knowledge on AEFI, 33.5% healthcare workers had encountered an AEFI and 56.4% reported such within 24hours.<sup>8</sup> Study on determinants of uptake of pentavalent vaccine in Benin city, Southern Nigeria; also showed that 76.9% of caregivers had a good knowledge on AEFI due to pentavalent vaccines which increases with the age and being married.<sup>9</sup>

The study on assessment of mothers' knowledge and practices regarding AEFI of their children in rural area of Tripura revealed that 90.0% mothers have heard about one or more types of AEFIs and know the names of commonest AEFIs.<sup>10</sup> A study on experience of mothers in immunisation centres in Enugu reported that about 57.4% of the mothers responded to these reactions by giving the child paracetamol, 21.1% stopped further immunisation temporarily, while 19.5% took the child to hospital. 0.9% of the mother each either took their children to native doctors or gave native mixtures. 88.6% of those temporarily stopped immunisation re-started

after a while.<sup>12</sup> A study in Uganda reported that there were use of common approaches to managing both side effects and AEFI with slight variation between urban and rural areas, caregivers rarely report AEFI to immunisation centers as expected; immunisation centers also handle reported AEFI cases as other ordinary illnesses and simply refer them to the outpatient department.<sup>13</sup>

Literature on qualitative studies on AEFI is not readily available. Majority of the studies are conducted in the urban communities thereby not exploring the problems within the rural areas where quite significant number of the population live. To achieve SDG 3.2, there must be at least 50 percent reduction in early childhood mortality rates before 2030 across all groups. This study aimed to assess mothers' knowledge and practice of AEFI management. The findings will help the policy makers in designing programmes to combat AEFI and also designing programmes to improve immunisation coverage and utilization.

## II. METHODS AND MATERIALS

The study was carried out in Oyo and Ekiti State, Southwest (SW) Nigeria. The states are administratively divided into local government areas (LGAs), which are in turn made up of political wards. The indigenous people of the SW are mainly Yorubas with some non indigenes such as Hausa, Igbos, Ebiras, and other ethnic groups. The predominant religions are Islam and Christianity and few traditional worshippers.<sup>15</sup> Both states have numerous public and private health care facilities (primary health centers, comprehensive health centers, general hospitals and teaching hospitals) that offer immunisation services, both routinely and as supplemental programs. This study which was a community-based comparative qualitative household study involving rural and urban households. The study population consists of mothers of children under-five years in household within the selected rural and urban communities of Oyo and Ekiti State with previous exposure to NPI vaccine. Mothers that have been living in the community for at least 6 months preceding the study were included in the study.

Multi stage sampling method was used to select the respondents. In stage 1, from the six states in SW region, two states (Ekiti and Oyo states) were selected by simple balloting. Stage 2: from the selected states one rural (Ifelodun/Irepodun, and Afijio) and one urban (Ado and Akiyele) local governments were selected by simple balloting. In stage 3, from a sampling list of wards in the selected LGAs, two wards were selected by balloting in each LGA (an average of ten to thirteen wards exists in each local government area). Esure was selected from Ifelodun/Irepodun LGA while Opopogbooro were selected from Ado LGA in Ekiti State. On the other hand, in Oyo State Awe was elected from Afijio LGA, while Alabata were selected from Akiyele LGA. In each of the selected wards, one settlement was selected by balloting from the comprehensive list of the settlements that was obtained from the National Population Commission in Stage 4.

Purposive sampling method was then used to select the first eight to twelve mothers in each selected settlement with the primary responsibilities over the care and health decision-

making regarding children below five years, who had previously received immunisation and who consented for the study. They were selected for participating in FGD with the assistance of the Ward Focal Person on immunisation in the respective wards.

Data collection was conducted over a period of 8 weeks from January 7 to March 2, 2019. Four sessions of FGD in all were conducted, two in the rural and two in the urban settlements. A focus group guide was used for qualitative data collection. This involved focus group discussions (FGDs) on mothers of children 0-5 years selected to collect relevant information on: respondent's perception towards immunisation, immunisation safety and AEFI and the usual practice of caregivers after encountering AEFI. The duration of FGDs were between 45-60 minutes, determined by saturation of ideas i.e. until a point where no new ideas emerge. Each focus group consisted of 8-12 persons, with a moderator and a note-taker.

Data from the FGDs were transcribed and analyzed using the ATLAS.ti version 7 software. The transcripts for FGDs were analyzed by focusing on recurrent, dominant, and divergent opinions. Themes and sub-themes were generated to address the objectives of the study; results were presented in tables and prose.

Research approval was obtained from the Ethics and Research Review Committee of the Federal Teaching Hospital, Ido-Ekiti, Nigeria. Written consent for interview was obtained from all respondents after giving them an explanation on the nature, purpose and benefits of the study, as well as providing information to address confidentiality issues.

## III. RESULTS

Four FGDs sessions were conducted in the study with a total of 37 participants. All the participants were female respondents. In the rural group 2 sessions were conducted (1<sup>st</sup> group with 8 respondents and 2<sup>nd</sup> group with 10 respondents). Similarly, 2 sessions were conducted in the urban group (1<sup>st</sup> session with 10 respondents and 2<sup>nd</sup> group with 9 respondents). The issues discussed include: What the participants know about immunisation and AEFI; Practices of caregivers after encounter an AEFI; Different forms of AEFI that were experienced by the caregivers.

### *Caregivers' knowledge on immunisation and AEFI*

Majority of the respondents in rural and urban communities have some background information on immunisation and AEFI. Most of the urban respondents can mention the names of the vaccine and the corresponding diseases that can be prevented by their administration, while the rural respondents recognized the vaccine by the route of administration.

*"We were told that immunisation prevents diseases like measles, tuberculosis and polio"* (29 year old urban caregivers).

*"Immunisation increases children's immunity"* (31 year old urban caregivers).

*"Immunisation is good for the children, a child that received it will be very healthy"* (26 year old rural caregivers)

“My baby sometimes develop fever after receiving immunisation, even my neighbor does not like to bring her baby for immunisation because the effect is worrisome” (37 year old urban caregiver)

“Non availability of the vaccines discouraged me from collecting immunisation for my children, also because of the side effects of the vaccines like swelling of injection site that happened to one of my children” (32 year old rural caregiver)

“AEFI could be as a result of the healthcare workers mistakes or can results if the child has some illness before which was not obvious”(21 year old rural caregiver).

“AEFI can result from not following instructions for example, I don’t know that I should not stress the child; I embarked on a journey which resulted in fever and irritability on the child.”

activities so as to have time to take care of my baby at home” (29 year old urban respondent)

“We are have been warned not to give paracetamol, but I used to pity my baby so I will give him small paracetamol before going for immunisation” (28 year old urban respondent).

“I don’t allow people to carry my baby after vaccination, I am extra careful in handling her, I will bath for her, use shear butter and robb to message the injection site to reduce the pain”(32 year old rural respondent)

“If my child has swelling at the injection site I will compress it with cold water, in case of fever I will bath her with look warm water and avoid diaper for the period; I know all these measure work so I don’t think it’s necessary to represent at health facility” (35 year old rural respondent)

“If my child has swelling at the vaccination site, I will use an handkerchief soaked with kerosene or petrol to massage the site” (25 year old rural respondent).

TABLE I: The themes and subthemes emerging from FGD among caregivers of Under fives in urban and rural communities.

Theme and Subthemes	Rural	Urban
<b>Knowledge of AEFI</b>		
Immunisation prevents disease	+++	++++
Mention names of some vaccines	++	+++
Immunisation makes children to develop some complaints	+++	+++
AEFI is usually due to immunisation	++	++
Mention different types of AEFI	++	+++
<b>Caregivers’ practice concerning AEFI</b>		
Given medications before immunisation	+++	+
Given medication after immunisation	+++	++++
Nothing is given	++	++
Tepid sponging	++	+++
Application of ice pack on injection site	+	+++
Application of ointments like shear butter and so on	+++	+
Application of hot steam on injection site	+++	-
Return the child to health facility if there is any complaint	+	+++

**Key**

- Not mentioned
- /+ Divergent opinions
- + Mentioned by < 25% of the respondents
- ++ Mentioned by 25 -50% of the respondents
- +++ Mentioned by 51 -75% of the respondents
- ++++ Mentioned by > 75% of the respondents

*Practices after encountering an AEFI*

There are different practices among the urban and rural communities. Most urban respondents do not give anything to their children before immunisation, because they want the vaccine to be effective. On the other hand, the rural respondents believed that something must be done to reduce the pain and fever that may likely follow immunisation. Majority are of the opinion that pain reliever should be given after immunisation. Some have the believe that the child does not need any medication what so ever because the vaccine is a drug on its own but the child need extra care, attention and obeying the instructions given by the health care workers appropriately. Majority of the urban respondents believed that child must be returned back to health facilities if there is any complaint after vaccination. Application of all sort ointments was rampant among rural respondents.

“I will report to health facility in case I notice anything like swelling of injection site and unusual fever to prevent self medication” (39 year old urban respondents)

“I know that I cannot do any other thing the day my child receives immunisation, I will take excuse from work and other

IV. DISCUSSION

The study showed that a good number of the participants are aware of AEFI, Most of the urban caregivers knew that AEFI can present as diseases, can be life threatening or even cause death, they can recognized some programs errors that can be associated with AEFI better than the rural respondents. Both groups mentioned common type of AEFI like fever, swelling of the injection site, injection site redness, paralysis of the limbs, convulsion, rash and headache. Majority of the respondents recognized that pentavalent vaccines as the most likely vaccine that can cause an AEFI, The findings were similar to what reported by Nnenna *et al.* in Enugu.<sup>7</sup> On the hand, Ogunyemiet *al.* in Alimosho local government, a higher knowledge score of 80% fair/good knowledge though the study was conducted among health workers who were supposed to have a preformed knowledge on AEFI.<sup>8</sup>

This study showed that some proportion usually give paracetamol before immunisation especially the rural groups; other practice like giving herbal concoction, spiritual water, antibiotics and haematinics were reported. After immunisation, most of the caregivers used to give paracetamol after immunisation the reason for the practice after immunisation was to reduced pain and fever. Applications of all sorts of ointments like, kerosene, shear butter, mentylatum, local incision of swollen injection site were common among the rural caregivers.

The reason for these poor practices might be due to the knowledge gap on AEFI that was noted mostly among the rural caregivers and poor utilization of health facilities and overwhelming self medication. Majority of the respondents indicate that the willingness continue with immunisation despite AEFI in both group, few respondent indicated that they will stop immunisation temporarily, in the rural and in the urban group; very few in both group indicated that they will stop immunisation finally. Similar findings were reported by Nnenna *et al* in Enugu that most mothers believed that immunisation should continue despite the occurrence of AEFI and that suffering from AEFI is better than suffering from diseases.<sup>7</sup>Also, Brakaet *al*, in Uganda reported that caregivers



rarely report AEFI to immunisation centres as noted in this study.<sup>8</sup>

#### V. CONCLUSION/RECOMMENDATIONS

Limitations of the study: AEFIs are reported by the caregivers, which are subjective findings of individual caregivers. Caregivers must be encouraged to report advent event without fear of penalty or blame especially the severe form.

#### *What this study adds?*

Being a qualitative study with confidentiality well assured, mothers were able to express themselves freely without fear of coercion. Unusual practice of application of kerosene and local incision on immunisation site was detected

#### *Financial support and sponsorship*

Nil

#### *Conflict of interest*

There was no conflict of interest.

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