



## Findings from post-intervention analysis of pre-eclampsia/eclampsia in Kogi State

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## BACKGROUND

Despite global efforts to reduce preventable maternal and neonatal mortality, Nigeria’s maternal mortality ratio is estimated at 576 deaths per 100,000 live births and neonatal death is estimated at 37 per 1,000 live births .

Maternal and newborn deaths due to pre-eclampsia and eclampsia (PE/E) are preventable, yet in Nigeria this is the most significant direct cause of maternal mortality.

To appreciate the enormity of this problem at country and state levels, Population Council conducted a landscape analysis on PE/E in seven states in Nigeria were to understand Nigeria’s PE/E context, including assessment of evidence gaps over the last 15 years, and to determine priority areas for research and interventions around PE/E. This brief presents study findings from Cross River State on post-intervention landscape changes in:

- Programmatic and policy support for PE/E prevention and treatment;
- PHC facilities’ capacity to manage PE/E;
- Provider knowledge and competence in preventing, detecting, and managing PE/E; and
- Community awareness, beliefs, and experiences around PE/E.

## METHODS

This PE/E study is a pre/post, cross-sectional design with both qualitative and quantitative data collected at baseline (2015) and endline (2018). Data collection activities include in-depth interviews (IDIs) with policy makers, survivors of PE/E, and laboratory workers; focus group discussions (FDGs) with men and women from the community; and surveys and observations of client-provider interactions to assess provider capacity in antenatal care (ANC) and facility readiness and capacity to identify, treat, and manage PE/E at the primary and secondary levels.

Table 1 describes data collection activities at baseline and endline in Kogi.

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	Baseline	Endline
IDIs with policy makers	10	28
IDIs with PE/E survivors	5	6
IDIs with laboratory professionals	-	6
FDGs with married men & women	4	4
Surveys with providers	74	73
Assessments of health facilities	8	60
Observations of ANC visits	15	266

### PE/E IN BRIEF

- PE is a condition in pregnant women marked by an increase in blood pressure and protein in urine after 20 weeks gestation; eclampsia is a life-threatening condition characterized by convulsions in women with PE.
- Providing high quality ANC improves the prevention and early detection of PE and can prevent its progression to eclampsia.
- PE/E can be managed by administering anti-hypertensive drugs and MgSO<sub>4</sub>.

### CORE INTERVENTION

- Intervention research occurred in Cross River, Ebonyi, and Kogi states, in 2016 and 2017, and follow-up data was collected from May-June 2018.
- 557 primary health care (PHC) providers received one month of training with continuous mentorship to identify hypertension and PE/E, treat with MgSO<sub>4</sub>, and refer to secondary facilities.
- The primary objective was to facilitate task-shifting to PHC providers of MgSO<sub>4</sub> loading dose administration and secondary facility referral for improved PE/E detection, treatment, and management.

The Ending Eclampsia project seeks to expand access to proven, underutilized interventions and commodities for the prevention, early detection, and treatment of pre-eclampsia and eclampsia and strengthen global partnerships.



## POLICY INFLUENCE

At endline, researchers interviewed 28 local government area (LGA) and state policy makers revealing mixed awareness of the national protocol on managing PE/E through task shifting to PHC providers. Though more local policy makers knew of the national protocol than at baseline, at least one LGA health manager did not know whether task shifting had been implemented in their area. Those who are aware of the protocol support task shifting to lower level cadres for PE/E management.

*“In general, [task-shifting and referral] is very good because it will help the pregnant women, it will help our patients.”*

– LGA health manager, 2017

Policy makers are concerned about pregnant women registering late for ANC as a principle challenge in detecting and managing PE/E. Policy makers cite poverty and lack of information about ANC as barriers to women’s care-seeking behaviors.

*“Beginning with the antenatal services, some of them do not have the financial ability to access the services and some other persons, due to their literacy level, do not see the need to attend antenatal clinics. Some of the husbands do not allow their wives to attend antenatal clinics, and many of them do not keep to their appointments. They miss appointments due to one reason or the other.”*

– LGA policy maker, 2018

## FACILITY CAPACITY & PREPAREDNESS

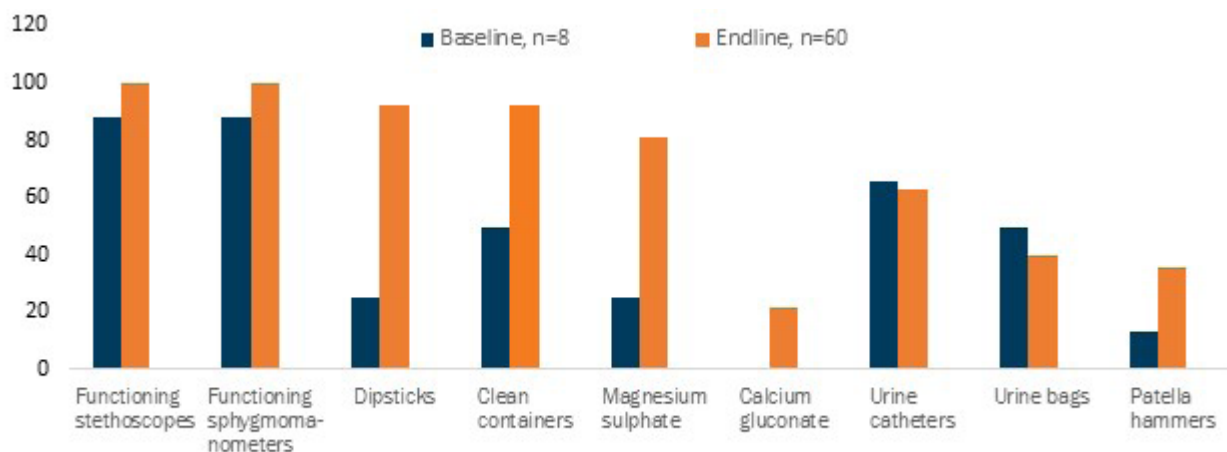
At baseline, researchers visited eight health facilities in Kogi and found that only one (13%) had guidelines available to manage PE, one had all vital ANC equipment, and four consistently used MgSO<sub>4</sub> to treat PE/E. At endline, researchers visited 48 primary and 12 secondary healthcare facilities and observed that 56 (93%) have available guidelines to manage PE (p<0.001).

At baseline, only one out of eight facilities (13%) had all the necessary ANC equipment to detect PE/E; at endline, five out of 14 facilities (36%) had all equipment. At baseline, 75% of facilities reported capacity to procure MgSO<sub>4</sub> and, of those, 50% asked clients to purchase the drug themselves. At endline, 59% of facilities purchased MgSO<sub>4</sub> from local pharmacies, while only 13% asked clients to procure it themselves.

Though not statistically significant, the decrease in percent of clients who were asked to procure MgSO<sub>4</sub> themselves indicates that facilities are now better able to procure the drug than at baseline.

Eighty-one percent of facilities at endline had MgSO<sub>4</sub> available on-site, compared to only 25% at baseline. Four (50%) facility managers said they always used MgSO<sub>4</sub> at baseline, and at endline 22 (42%) managers reported always using MgSO<sub>4</sub>. At baseline, two (25%) facility managers said they sometimes use MgSO<sub>4</sub> to manage PE/E, while at endline 12 (23%) report sometimes using it. Neither of these changes was statistically significant and percent decreases are likely due to sample size differences.

Figure 1: Facilities with key equipment to detect and manage PE/E and MgSO<sub>4</sub> toxicity (%)



Researchers identified the number of facilities that stocked key equipment to detect and manage PE/E and treat MgSO<sub>4</sub> toxicity. Improvements were observed at endline for stocking all key equipment except urine bags (Figure 1).

A critical component of managing and treating severe PE/E is the capacity to conduct emergency obstetric and neonatal care (EmONC) by providing key signal functions and essential drugs to mothers throughout the pregnancy continuum (pregnancy, labor and delivery and postnatal).

Of all facilities visited in Kogi State at endline, 14 (23%) stock all essential equipment, and 36 (60%) stock at least three-quarters of the essential supplies. Table 2 compares facilities' capacity to provide EmONC signal functions at baseline and endline.

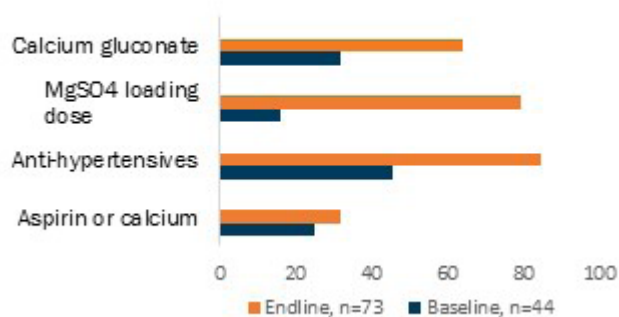
	Baseline, n=8		Endline, n=60	
	Capacity	Done in past 3 mos	Capacity	Done in past 3 mos
Perenteral antibiotics	7	6	56	52
Parenteral oxytocics	6	7	56	52
Parenteral anticonvulsants (MgSO <sub>4</sub> )	7	6	43	26
Manual placenta removal	8	7	50	31
Retained products removal	6	6	43	26
Assisted vaginal delivery	7	7	38	33
Blood transfusion	7	7	22	19
Caesarean section	6	6	12	10
Neonatal resuscitation	7	6	52	42

## PROVIDER KNOWLEDGE & SKILLS

At endline, 73 providers from primary and secondary facilities in Kogi State responded to questions about preventing, detecting, and treating PE/E. Providers can correctly identify and manage hypertension in pregnancy.

Ninety percent of providers correctly diagnosed hypertension at endline compared to 86% at baseline, and significantly more providers use antihypertensive drugs to treat hypertension at endline compared to baseline (85% vs. 45%; p<0.001).

**Figure 2: Providers' knowledge of drugs for PE/E prevention and management (%)**



A key component of task shifting from secondary to primary facilities is PHC providers' capacity to prevent and manage PE/E using antihypertensive drugs, MgSO<sub>4</sub>, and calcium gluconate to treat MgSO<sub>4</sub> toxicity.

Figure 2 highlights knowledge improvement among PHC providers from baseline to endline.

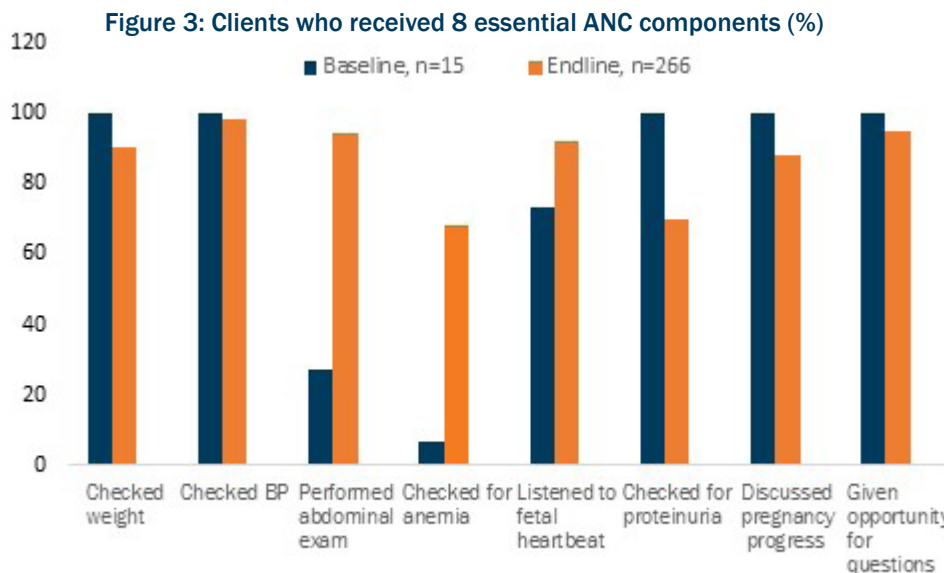
This intervention is based on the Pritchard method for administering loading and maintenance doses of MgSO<sub>4</sub> to treat severe pre-eclampsia and prevent the onset of eclampsia. At baseline, 16% of providers could correctly describe the loading dose of MgSO<sub>4</sub> and none knew the appropriate maintenance dose. At endline, 79% know the appropriate loading dose (p<0.001) and more than half (52%) know the correct maintenance dose (p<0.001).

Similarly, the number of providers who know the correct antidote to MgSO<sub>4</sub> toxicity doubled from baseline to endline (32% to 64%, respectively, p=0.001). Kogi State was the only state where the number of providers able to correctly identify pre-eclampsia decreased (from 95% to 67%; p<0.001), though this may be attributed to a shorter intervention period in Kogi.

## QUALITY OF CARE

Quality of care was assessed through 266 observations of client-provider interactions during ANC consultations, qualitative data from four men's and women's community FGDs, and six interviews with PE/E survivors. Figure 3 compares the proportions of ANC components that clients received at baseline and endline. At baseline, virtually all clients had their blood pressure checked during the observed ANC visits. However, 76 clients (30%) did not have their urine tested for protein.

Clients' reports confirm findings from Figure 3 that BP, proteinuria, and weight screenings often occur during ANC. In an important contrast to baseline findings where no providers were observed discussing the symptoms of



impending eclampsia, women in Kogi State now report that, following BP and urine checks, they discuss with their providers the potential complications of high BP and proteinuria, specifically maternal or fetal death. Fifty-two percent of providers were observed counseling their clients about referral processes for complications and delivery, and 95% of clients were given the opportunity to ask additional questions during their ANC visits.

Women report that they are well-treated in health facilities and seem to trust the health care system.

*“When you get to the doctor - they care for you.”*

*- Pre-eclampsia survivor, 2018*

*“They treated us very well whenever we came because I delivered my baby through CS so they never treated us bad, they always treated us good.”*

*- Pre-eclampsia survivor, 2018*

Laboratory staff report mixed experiences with supply stocks. While some facilities experience infrequent stock outs of dipsticks for proteinuria, likely due in part to regular oversight and procurement procedures, other facilities experience frequent stock outs and delayed replenishments.

*“The materials, the laboratory consumables, the reagents we are using in the laboratory most of the problem we are having is from that area sometimes you write a request out for reagent it may take you about a month before you will be able to get the reagent pack.”*

*- Laboratory department head, PHC, 2018*

*“Urinalysis is not something you will have shortage of consumables because they are cheap and they are always readily available; I don’t know when last we were short of consumables.”*

*- Laboratory scientist, general hospital, 2018*

## COMMUNITY KNOWLEDGE & PERCEPTIONS

Community knowledge and perceptions of hypertension and related complications during pregnancy are mixed. Similar to baseline, men and women attribute the symptoms of hypertension to a woman’s over-thinking and fear, and religious leaders cite spiritual attack. Interestingly, men in Kogi State perceive the cause of hypertension to be a woman’s failure to attend ANC, while women (both FGD participants and PE/E survivors) overwhelmingly state that most women in Kogi State seek health services from ANC providers.

Some community members describe a woman’s husband and mother-in-law as encouraging her to seek facility-based care, while others say that husbands and mothers-in-law may dismiss hypertension-related symptoms as signs of laziness or a woman’s “pretending.”

At endline, community members report that some women seek facility-based care, while others continue to use herbal medications. Men and women in the community cite financial concerns as the primary barrier to women’s ANC attendance, though most survivors of PE/E say that finances were not a concern in her decision to go to the hospital for care. At endline, men and women have differing perceptions of religious leaders’ roles in the health system. Women report that religious leaders will simply pray for a woman’s health,

while men reported religious leaders act as barriers along the referral pathway by delaying women's seeking care at facilities.

*"At times pastor tell them that they should be coming for prayer instead of advising them to visit the hospital for proper check-up. They will be deceiving them to be coming for prayer. That one will discourage them to visit the hospital."*

– Male FGD participant, 2018

## SURVIVOR'S EXPERIENCES

While most survivors attended ANC, the timing and reasons for seeking care varied widely. One woman began ANC at two months to verify that she was pregnant and subsequently attended at least 10 ANC check-ups, while another survivor registered for ANC during her 8th month because she was experiencing headache and other symptoms, which she believed were due to malaria.

Survivors consistently report that providers check their BP and urine, though BP test results are more frequently discussed than urine. A few women state their providers discussed with them the potential consequences of high BP or proteinuria during, including convulsion, and recommended a cesarean section (CS) delivery.

*"Like the day I delivered my baby, when I got there I explained to them that I am not okay and that I am feeling pain. So, they checked my BP... when the doctor saw the scan result, he said that my BP was too high, that they have to admit me; they also said my first CS was just two years ago and I have high BP so they cannot advise me to go through the pain of delivery. That if I have money they will advise me to still use CS. But before then they will calm my BP. So, they asked us to buy injection and tablets, and they used it all on me before taking me to the theater."*

– Pre-eclampsia survivor, 2018

## DISCUSSION

Policy makers recognize the importance of scaling up task-shifting of MgSO<sub>4</sub> loading dose administration and referral to PHC providers, and see it as a means of overcoming barriers to hospital attendance. Facility capacity to detect, treat, and manage PE/E has improved. Fewer women are responsible for procuring their own MgSO<sub>4</sub>, which contributes to improving facility accessibility and affordability. More facilities in Kogi stocked all or most key equipment for detecting and managing pre-eclampsia and MgSO<sub>4</sub> toxicity than in any other state.

Sufficient supply chain commodities have implications for provider capacity, and provider capacity in Kogi State improved significantly when identifying and managing women with hypertension. Conversely, providers at endline were less able to correctly identify PE/E. This may be linked to the fact that Kogi State remained the comparison, non-intervention state for implementation. Focused re-training on PE/E identification at the community level, or supplemental training at the PHC level like those that occurred in Cross River and Ebonyi states, will further improve providers' diagnostic knowledge retention and women's uptake of care.

Gender-based and intergenerational differences in community and survivor perceptions of key components of pregnancy care may affect ANC attendance and response to symptoms. Mixed use of traditional and facility-based health services and low integration of religious leaders into the health system offer opportunities for continued health education and community collaboration.

One limitation of the data is the unequal sample sizes from ANC observations at baseline and endline. The duration of the intervention was relatively short (14 months); a longer period may have demonstrated further increase in provider knowledge and confidence in practices around PE/E care. However, triangulating across different data sources and types renders our study findings robust.

## RECOMMENDATIONS

- Sustain support for supply chain procurement and linkages to existing distribution system;
- Re-train providers at primary and secondary levels to correctly identify pre-eclampsia, incorporating antihypertensive drugs training that was previously implemented in Ebonyi State;
- Continue mentoring efforts and supportive supervision for PHC providers to detect and manage hypertensin in pregnancy, including PE/E; and
- Expand community health education about the causes, signs, symptoms, and complications of hypertension during pregnancy, with particular emphasis given to engaging pre-existing women's and other community groups.

## REFERENCES

1. DHS Nigeria, 2013.

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