Increasing Measles Immunization Coverage in Borno State, Nigeria: Some Policy Options

Significant increase in measles immunization coverage can be achieved in Borno State as well as in other states if the existing Free Immunization Program is complemented with media awareness campaign and house-to-house visitations programs.

"Measles remains one of the leading causes of infant morbidity and mortality in Nigeria"

1. Introduction

Measles remains one of the leading causes of infant morbidity and mortality in Nigeria. Despite the efforts made by the Nigerian government, policymakers and other stakeholders to increase children vaccination against infections, measles vaccination coverage remains very low. This situation is particularly profound in the Northern part of the country, with Borno State requiring urgent attention. Therefore, this policy brief presents a summary of a policy simulation study of two measles immunization programs for children of age 9-23 months which can be used to boost measles immunization coverage in Borno State. These programs are free immunization against measles with media awareness campaign (Policy A) and free immunization against measles with house to house campaign (Policy B).

Overall, the results reveal that providing free immunization against measles complemented with media awareness campaign is more effective and beneficial than free immunization complemented with house to house visitation. However, for government to significantly increase measles immunization coverage, reduce measles induced death as well as make significant progress towards the attainment of Millenium Development Goal (MDG) 4 in Borno State, the existing policy of free immunization should be complemented with house to house campaign in the rural areas which are characterized by high levels of illiteracy. Similarly, in the urban areas where most people are educated, the free immunization programme should be supported with media awareness campaigns.

2. Policy Goals and Alternatives

The policy goal is to increase immunization coverage against measles in Borno State while the target is to achieve at least 98% gross measles immunization coverage of children aged 9-23 months in Borno State by the end of 2020. This brief proposes two policy alternatives which can complement the existing Free Measles Immunization (FMI) policy and help achieve this goal:

- **Free immunization against measles combined with media promotion/awareness campaign (hereafter policy A)**
- **Free immunization against measles combined with house to house visitations (hereafter policy B)**

The proposed alternatives seek to address the factors hampering the success of the existing immunization program in Nigeria. Policy A involves the use of print and electronic media for creating awareness and sensitization to parents while policy B entails house to house sensitization of parents on the importance of vaccination against measles. Both programs require the commitment of trained personnel as well as cooperation of communities, and it is assumed that government will get this required level of support.

3. Methodology

The policy simulation analysis follows five basic steps. First, the relative effectiveness of the policy alternatives is derived. Secondly, the costs of the programs are calculated by considering all the necessary cost components. Thirdly, relying on the cost and effectiveness estimates, the cost-effectiveness ratios (CERs) are calculated for both programs to determine which one is more cost-effective. Fourthly, sensitivity analysis is conducted to highlight the impact of changes in the parameters used in the analysis on the results. Lastly, equity considerations in the distribution of benefits are examined by grouping the beneficiaries into five income groups, ensuring that the poor adequately benefit from increased coverage, with little or no tradeoff from the rich.

Data used for this analysis were sourced from publications of the National Bureau of Statistics - the Annual Abstract of Statistics (2009) and Social Statistics (2009). Other sources include: Federal Ministry of Health, National Programme on Immunization, National Population Commission, World Health Organization, and the World Bank. In few cases, some data – including average income and growth or changes were derived using several assumptions.

4. Results and Discussion

The results of the simulation show that policy A will achieve gross measles immunization coverage of about 95% by 2020 while policy B will achieve about 98% gross immunization coverage in the same period. This implies that policy B is more effective than policy A. Again, Policy A has a lower cost as it results in unit a cost of NGN 401 per child in 2013 as against NGN 467 per child for policy B. However, this does not necessarily imply that either policy A or policy B is better. To decide this, both the cost and the effectiveness measure are jointly considered and this is reflected in the CERs of the programs.

The CERs for policy A and policy B are shown in Tables 1 and 2, respectively. If policy A was implemented, about 15,869 cases of measles will be avoided while 163 deaths will be averted by 2020. Combining the cost and the effectiveness measure (Table 1), the CER for policy A based on morbidity and mortality measures of effectiveness will be 13,866 and 1,346,244, respectively. For policy B (Table 2), a total of 17,633 cases of measles and 188 deaths will be avoided by 2020. The CER for policy B will be 14,908 and 1,447,384 for morbidity and mortality measures of effectiveness, respectively. These results mean that policy A is more cost-effective than policy B, since it has the lower CER.

Table 1: Cost-Effectiveness Ratio (CER) of Policy A

Year	Estimated Incremental cost of Policy A (NGN)	Discount Factors @ 3%	Discounted Incremental cost of Policy A (NGN)	Decrease in Morbidity	Decrease in Mortality
2013	16,985,562	1	16,985,562	680	7
2014	23,914,467	0.971	23,217,929	1,327	14
2015	28,662,984	0.943	27,017,611	1,776	18
2016	33,061,960	0.915	30,256,377	2,192	23
2017	35,464,199	0.888	31,509,482	2,419	25
2018	36,005,426	0.863	31,058,597	2,470	25
2019	36,320,952	0.837	30,418,226	2,500	26
2020	36,388,286	0.813	29,587,006	2,506	26
Total	**246,803,837**		**220,050,791**	**15,869**	**163**
				CER (Morbidity)	13,866
				CER (Mortality)	1,346,244

"…the results of the CER computed for the two programs show that policy A is more cost-effective than policy B since it has the lower CER".

Table 2: Cost-Effectiveness Ratio (CER) of Policy B

Year	Estimated Incremental cost of Policy A (NGN)	Discount Factors @ 3%	Discounted Incremental cost of Policy A (NGN)	Decrease in Morbidity	Decrease in Mortality
2013	21,928,197	1	21,928,197	755	8
2014	29,315,237	0.971	28,461,395	1,475	15
2015	34,435,039	0.943	32,458,327	1,973	20
2016	39,177,972	0.915	35,853,394	2,435	25
2017	41,768,042	0.888	37,110,364	2,688	28
2018	42,351,587	0.863	36,532,851	2,744	28
2019	42,691,784	0.837	35,753,697	2,778	29
2020	42,764,383	0.813	34,771,356	2,785	29
Total	**294,432,241**		**262,869,582**	**17,633**	**182**
				CER (Morbidity)	14,908
				CER (Mortality)	1,447,384

*"If policy A is implemented, about **15,869 cases of measles** will be avoided while **163 deaths** will be averted by 2020."*

The sensitivity analysis reveals that the CER results are not sensitive to changes to the parameters - cost and effect size. Equity considerations which examined the distribution of coverage across different income groups suggest that the poor would benefit from the policy interventions.

5. Conclusion and Policy Recommendations

The study conducted a policy simulation on two programs that the government can use to complement its existing measles immunization program in order to enhance coverage in Borno State, Nigeria. The results of the simulation show that complementing the existing free immunization program with house to house visitations results in a higher coverage than complementing the program with promotions and awareness campaigns, even though the latter has a lower cost per child. Overall, the results from the cost-effectiveness analysis conducted show that the free immunization with promotion and awareness campaign is more cost effective.

Policy Recommendations

Some of the important policy recommendations that emerge from this policy simulation exercise are:

"For government to significantly increase measles immunization coverage...... the existing policy of free immunization should be complemented with house to house campaign in the rural areas..."

- For Borno State government and the federal government to achieve the objective of increasing measles immunization coverage of children aged 9-23 months, there is a need to complement the existing free measles immunization with house-to-house campaigns and media promotions to create the level of awareness needed to guarantee the success of the program across different locations.

- The house-to-house vaccination campaign and sensitization program should target the rural areas which are characterized by high level of illiteracy, uneven distribution of government hospitals, poor electronic and print media coverage which often keep parents out of touch with vaccination days. For the urban centers, it is strongly recommended that government should introduce a complementary policy of regular electronic and print media vaccination campaigns and sensitization since these centers are characterized by reasonable distribution of government hospitals, organized electronic and print media coverage and high level of literacy. These factors enhance the process of keeping parents updated with vaccination days and other government health programs.

- Giving the potential effectiveness of these complementary programs and the need to boost the attainment of MDG 4 across Nigeria, other state governments should also consider adopting these programs.

- Finally, there is need to put in place a good monitoring and evaluation system. This way, it will be easy to see whether the policies are being adequately implemented and if there are improvements in the measles vaccination coverage that can be associated with such policies.

Further Reading

This policy brief is a summary of a research conducted by CSEA. For the full report and other reports published by CSEA, please visit www.cseaafrica.org.

- Uneze, E.F., Akongwale, S. and Tajudeen, I. (2012), "Policy Simulation of Measles Immunization Programs for Children in Borno State, Nigeria", *a research report* prepared for the Global Development Network (GDN) under the Strengthening Institutions to Improve Public Expenditure Accountability Project.

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