

Mainstreaming health in the agriculture, education, and environment sectors to address priority communicable and non-communicable diseases in urban areas in Enugu State, Nigeria: political economy analysis, willingness-to-pay and discrete choice experiments

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Abstract

This project explores how the agriculture, education, and environmental sectors can support disease prevention in Enugu State using a Health in All Policies approach. Mixed methods—including WTP surveys, regression, and DCE—showed strong community support for integrated action. Up to 75% were willing to pay for CD and NCD prevention, with location as the strongest predictor. Fully integrated interventions achieved the highest uptake (83%). Strengthened multisectoral coordination and joint planning are essential for improving population health.



Introduction

Nigeria's rapid urbanization has produced densely populated informal settlements where basic amenities are scarce.[1,2] These multidimensionally deprived areas face overlapping challenges—poverty, poor sanitation, food insecurity, and weak infrastructure—that heighten the burden of disease.[3]

Urban slum dwellers experience both preventable communicable diseases (such as malaria, cholera, and tuberculosis) and rising non-communicable diseases (NCDs) like diabetes, hypertension, and cancer.[4]

Although providing, promoting, and maintaining the health of the people is the main task of the Ministry of Health, only 20% of people's health is related to clinical services [5] This reality underscores the need for a whole-of-system approach, in which all sectors align their policies and programs with shared health goals.[6] Nigeria's National Health Strategic Plan (2023–2026) and the Health Sector Renewal Investment Initiative (HSRII) advocate a sector-wide, evidence-driven approach. Yet, implementation depends on strong coordination and data-driven decision-making.[7]

Mainstreaming health in every sector—whether in farming, education, or environmental management—undergoes a health impact lens so that all sectors contribute to improved wellbeing and reduced inequalities.



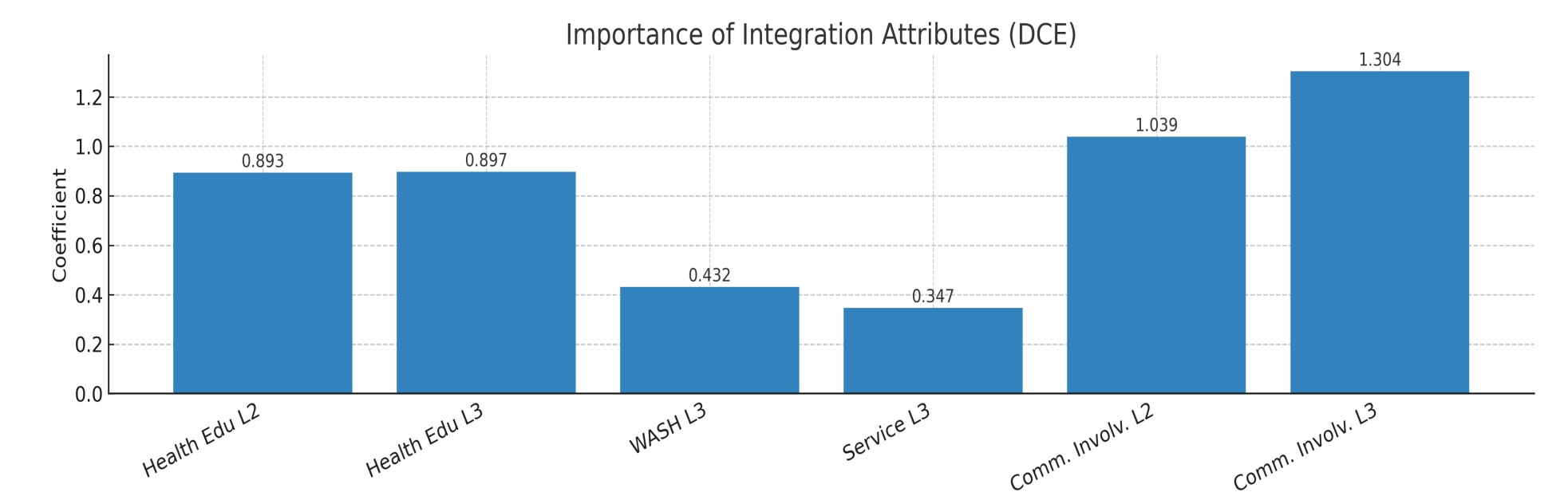
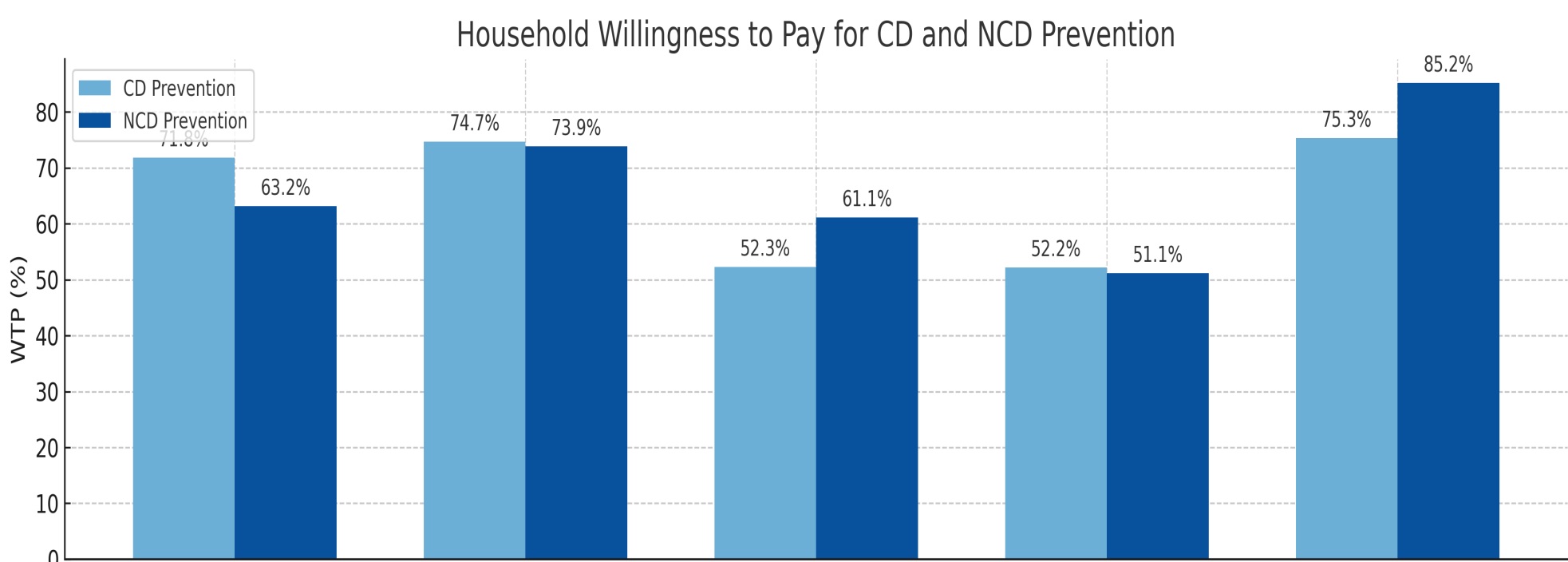
Figure 1. Co-creation design workshop with policymakers

Methods and Materials

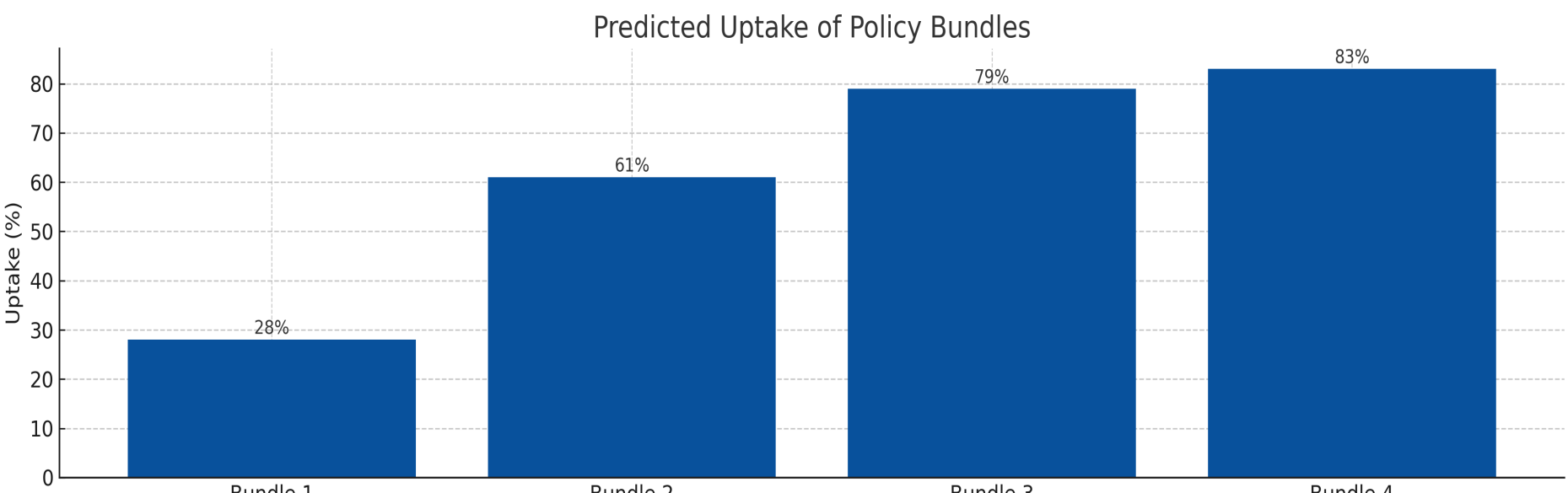
This study used mixed analytical approaches to generate evidence for multisectoral collaboration. Developed data collection instruments were modified through a co-creation design workshop involving stakeholders from agriculture, education, environment, and health sectors. As well as representatives of the private sectors and communities. Methods included in-depth interviews (IDI) with 27 policy makers, community stakeholders, SWOT analysis, political economy analysis, across the non-health sectors as well as willingness-to-pay (WTP) surveys for CD and NCD prevention, binary logistic and Tobit regression, and a discrete choice experiment (DCE) assessing heads of households' preferences for integrated service delivery. Findings were further validated through a co-creation workshop involving stakeholders from agriculture, education, environment, and health sectors.

Quantitative Results

Households demonstrated strong support for multisectoral health interventions: 71.85% were willing to make a one-off contribution for CD prevention, rising to 74.71% for a ₦5,000 bid. Price sensitivity was evident, yet affordability adjustments (e.g., ₦2,000 or ₦1,000) restored high willingness to pay. Logistic regression showed location as the strongest predictor of WTP—respondents in Nsukka (OR = 3.889, $p < 0.001$) and Udi (OR = 1.843, $p = 0.005$) were significantly more willing to contribute. Tobit models revealed wealth index and gender (female > male) as key determinants of maximum WTP. For NCD prevention, similar patterns emerged: 63.18% expressed initial willingness to contribute, rising to 73.87% for ₦5,000. Wealth index was a consistently significant predictor of higher WTP. DCE results showed that Level 3 community involvement ($\beta = 1.304$, $p < 0.001$), high-level health education, and WASH integration were the most valued attributes. Simulated uptake for policy bundles increased sharply with integration—from 28% in the baseline to 83% for fully integrated interventions across all sectors. Latent class analysis confirmed heterogeneity in preferences, with the dominant class showing strong support for community-driven, integrated health actions.



DCE Bundles	Integration Level	Key Features
1	Minimal	Low across all attributes
2	Moderate	Mid-level improvements
3	Partial High (WASH + Community)	Full WASH + full community-led
4	Full High (All)	Highest integration across all attributes



Qualitative Findings

On-going multisectoral collaborations towards the prevention and control of communicable and non-communicable diseases in Enugu State:

Education Sector

- Introduction of Smart Schools:
“These schools are being constructed with a big farm land well as, to grow food crops and a poultry for feeding the students”. (Female_Education_01)
“As the smart schools are being set up..... there's equally primary health hospitals upgraded in every ward. Such that the schools there can now relate with them when they have cases that are beyond their sick bay” (Male_Education_01)

- Health Education in the School Curriculum:
“Ensuring health topics are integrated into learning materials. we have health education in our curriculum. And that health education teaches how they can live a healthy life. It talks about how to live, how to maintain basic and proper hygiene, how to ensure proper sanitation in our environment.”(Female_Education_01).
“We have health education at the basic education level. And it is taken as a serious subject. Also we have family life education – that is health education, family life education –where bringing things like communicable diseases like HIV/AIDS, and parental care where it relates to health, population control and things like that. It's in the schools as educational policy, and it is being implemented in our schools.” (Male_Education_01)

- Vaccination Programmes:
“A collaborative effort between the health and education sectors. “when it comes to planning some projects - health intervention projects, teachers were called upon, because for instance for vaccination, and some other things like that, education controls population of the targets, mainly the children and the teenagers because they are mostly in school. So, because of that, we're called, and we normally teach them data and strategy to enhance the planning for effective implementation of interventions.” (Male_Education_01)

Agriculture Sector

- Farmers Training Programmes:
“We trained some people (in the ministry of) health, Ministry of Agriculture, some university professors, and some academics. We trained them at the National Animal Production Institute, Zaria. The training was a state government sponsored that trip - all expenses paid...We also had some people that are into (rearing)cattle, ... goats,...sheep.”(Female_Agriculture_LPRES_01)

Environment Sector

- Citywide Inclusive Sanitation Programme:
Other ministries were co-opted into this same STG (Steering Technical Group). Ministrieslike the gender affairs, ...environment,health. We have about 15 MDAs (ministries, departments and agencies) involved in this. Then last week, I was at the workshop at Abuja, on Urban sanitation. And The Ministry of Water Resources - that is the Citywide Inclusive Sanitation Programme” (Female_Water Quality Control)
Enugu State environmental and climate protection law. “We have Enugu State environmental and climate protection law. That was signed into law last year, July 2024. And we also operate with the public health law. These are the two documents or two legal documents that we operate with. The public health law and the Enugu State environmental and climate protection law, 2024.” (Male_Environment)

Stakeholders identified the following as the major constraining factors to the health mainstreaming initiative;

- Limited integration of health indicators into sectoral plans.
“we have a service charter. Every ministry's mandate is clearly written. What the government said every ministry should be doing is clearly outlined in their service charter, and you don't leave your own to encroach in that of another ministry. Internally here in the ministry of education, we have different departments, and there are role clarifications for each of them. Responsibilities are well defined. You cannot put money for immunization and sensitization in our budget, they will just expunge it. They will tell us that we cant have it since it is contained in the budget of the ministry of health. They will insist we stick to our own roles.” (Female_Education)

- Weak coordination among ministries and local governments.
“One of the challenges is lack of coordination. It prevents them from working together.” (Female_Community leader)

- Inadequate resource mobilization and inter-sectoral budgeting
“Fund. Normally the government don't make adequate funds for such, whether it's agric. or Minister of health or Education, they don't provide enough funds for them to execute on their programs. They have beautiful programs, but they lack the funds” (Male_Community leader)

- Lack of formal accountability framework for multi-sectoral outcomes.
“There is nothing like accountability” (Male_Community leader)

Conclusions

The study provides robust empirical evidence that households strongly support multisectoral, community-centred interventions for both CD and NCD prevention. Location, wealth, gender, and social capital significantly shape willingness to engage and pay. The findings reinforce the need for integrated governance structures, shared planning mechanisms, and cross-sectoral financing to improve population health outcomes in Enugu State.

Recommendations:

Enugu State should institutionalize a State Multisectoral Health Council, adopt Health Impact Assessments across sectors, strengthen WASH and school health systems, operationalize One Health approaches in agriculture, and establish joint budget lines across all the sectors for health-related activities. Embedding evidence-based multisectoral actions will position Enugu as a national model for health-integrated governance.

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