Impact of public health program on immunisation behaviour of children in rural Bangladesh

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Outline

- Impact evaluation of public health program
- Demand for immunisation
- Decomposition of program effect
- Interaction of program effect with other determinants

Background

- **Immunisation – a key public health outcome**
  - Saves 3 million lives worldwide each year
  - 750,000 children are saved from disability
- **Immunisation situation in Bangladesh**
  - stagnant coverage rate at 50 % & vaccination drop out is prevalent
  - lack of knowledge about vaccination and about its timing
  - EPI program has achieved impressive gains, but gap remains
- **MCH program - an exogenously assigned program**
  - treatment and non-treatment (control) area
  - similar demographic & socioeconomic characteristics
  - treatment area receives intensive family planning services

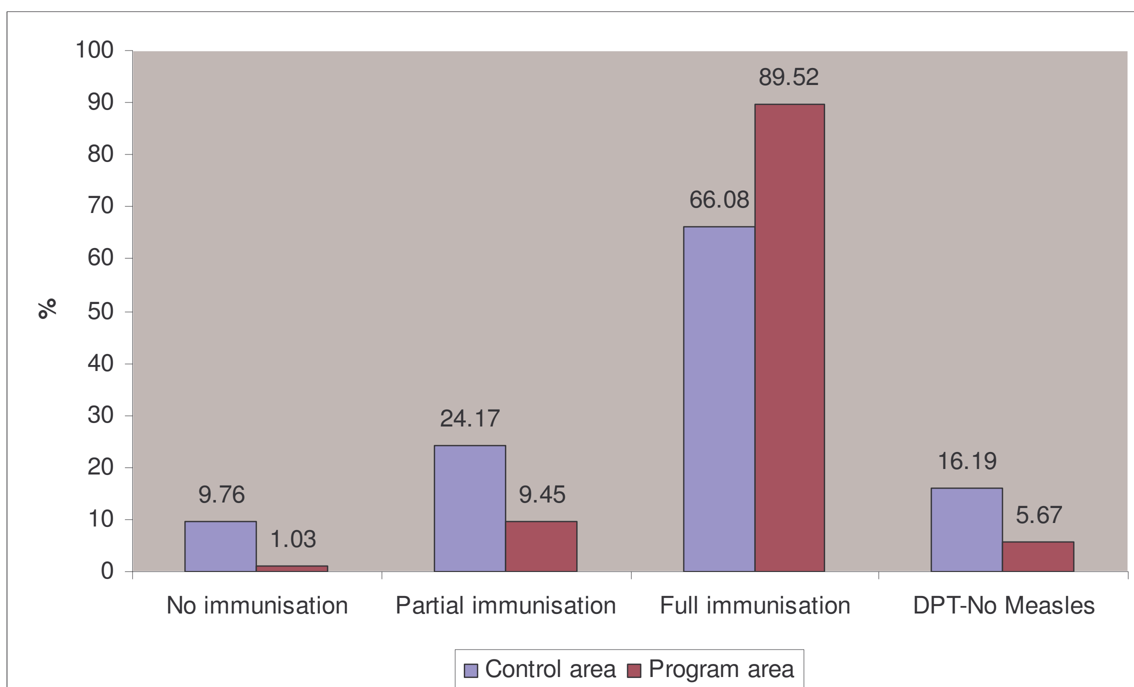
Expected impact of MCH Program on health care choice

- MCH components include information, education, and motivation activities
- Expected influence: MCH program strengthen household's capacity to engage in efficient health care choices through different channels:
  - **informational channel**
  - **income effect**
  - **substitute/complement to maternal education**
  - **compensates for low risk perception**
- Estimate demand for immunisation using standard household health production function (Grossman)

Data and empirical strategy

- Matlab Household and Socio-economic Survey (MHSS) 1996
- 1033 households that have full records of immunization
- Possible outcomes of immunisation – no, partial, & full immunisation
- Ordered Probit estimation technique is applied

Immunisation rate in program area and control area



Estimation Results

- Direct Program effect
- Decomposition of indirect effects
  - Information effect
  - Income effect
  - Maternal Education
  - Risk behaviour and risk perception
  - Interaction effects

Full sample – baseline model

	Full Immunisation		
Variable	Marginal Effect	z	P>|z|
treatment	0.2112	8.10	0.000
Household size	-0.0115	-1.49	0.136
age	0.0139	1.30	0.195
sex	-0.0078	-0.34	0.736
religion	-0.0034	-0.08	0.933
Household head's education	0.0058	1.48	0.140
Mother's education	0.0048	0.89	0.373
Household head's age	0.0018	1.35	0.179
Mother's age	0.0039	0.36	0.720
Square of mother's age	-0.0002	-1.02	0.309
Access to radio	0.0120	0.48	0.628
Access to health advertisement	0.0240	0.65	0.517
Log of household asset	-0.0033	-0.31	0.756
Household land holding	0.0148	1.41	0.157
Household head agriculturist	-0.0233	-0.74	0.458
Household head day labourer	-0.0046	-0.13	0.896
Household head unemployed	-0.1074	-1.07	0.283
Mother's employment paddy	0.0146	0.49	0.626
Mother's employment poultry	0.0767	2.92	0.003
Antenatal care visit	0.0431	3.47	0.001
Square of ante natal care visit	-0.0044	-3.80	0.000
Observation	1033		
Adj-R^2/Psuedo R^2	0.1149		
Log pseudo-likelihood	-569.4584		

Estimation result – program effect

- **Program effect**: MCH program has a significant positive effect 21.12%
- **Average Treatment Effect**: 19.1%

n Treatment	n Control	ATT	se	t
370	287	0.191	0.035	5.487

Program effect decomposed

- **Information effect**: MCH program stimulates demand through its informational awareness campaign (appendix table 3 & 4)
- **Income effect**: Results failed to identify any income supplementing contribution of MCH program (appendix table 5 & 6)
- **Maternal Education** has no significant independent effect on immunisation demand, which implies the lack of pure educational channel of mother's education on child immunisation
- **Risk perception** as proxied by number of prenatal visit is a strong predictor of demand for immunisation, and the effect of such visit is negative when prenatal visit is higher than certain optimum number

Full sample – interaction model

	Full Immunisation		
Variable	Marginal Effect	z	P>|z|
treatment	0.3545	4.92	0.000
Household size	-0.0121	-1.62	0.106
age	0.0127	1.19	0.234
sex	-0.0081	-0.35	0.728
religion	-0.0004	-0.01	0.991
Household head's education	0.0065	1.62	0.104
Mother's education	0.0108	1.65	0.099
Mother's education *treatment	-0.0149	-1.71	0.087
Household head's age	0.0018	1.43	0.153
Mother's age	0.0056	0.50	0.615
Square of mother's age	-0.0002	-1.10	0.272
Access to radio	0.0447	1.31	0.189
Access to health advertisement	0.0615	1.16	0.247
Access to radio *treatment	-0.0979	-1.78	0.075
Access to health advertisement *treatment	-0.0672	-0.71	0.477
Log of household asset	-0.0032	-0.30	0.767
Household land holding	0.0137	1.14	0.256
Household land holding *treatment	0.0023	0.12	0.902
Household head agriculturist	-0.0203	-0.65	0.513
Household head day labourer	-0.0052	-0.14	0.886
Household head unemployed	-0.0914	-0.94	0.348
Mother's employment paddy	0.0139	0.46	0.646
Mother's employment poultry	0.0763	2.86	0.004
Antenatal care visit	0.0505	3.20	0.001
Square of antenatal care visit	-0.0043	-4.12	0.000
Antenatal care visit *treatment	-0.0181	-0.62	0.537
Square of antenatal care visit *treatment	-0.0001	-0.02	0.982
Observation	1033		
Adj-R^2/Psuedo R^2	0.1233		
Log pseudo-likelihood	-563.99938		

Interaction effects

- MCH program is a substitute of mother's education
- MCH intervention compensates for the households access to information
- MCH program does not compensate risk attitude of households

Conclusion

- Public health care program creates greater awareness for childhood immunisation
- Maternal education - the best health agenda for the third world
- Policies designed to improve immunisation uptake should focus on providing information to mothers in an effective way
- MCH service provision can be followed
- Governmentally provided health services have important contribution to immunisation uptake