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Innovations in Evaluating Health Campaigns in Developing Countries

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Understanding the **What** and the **How**:

Combining treatment effect models with mediation analysis for comprehensive SBCC evaluation

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Communication and Malaria Initiative in Tanzania (COMMIT)

- Launched in October 2007
- Supported with $15 million from PMI
- Phased expansion to all districts in Mainland Tanzania by 2012
- Emphasis on promoting use of bed nets
- Implementing partners: PSI, Jhpiego, RTI

Malaria burden in Tanzania

Malaria Prevalence in Children 6-59 Months, 2007/8

Prevalence of Malaria
- 0% - 9%
- 10% - 19%
- 20% - 29%
- 30% - 39%
- 40% - 49%

Source: Tanzania HIV & Malaria Indicator Survey, Preliminary Report. NBS & ORC Macro, August 2008
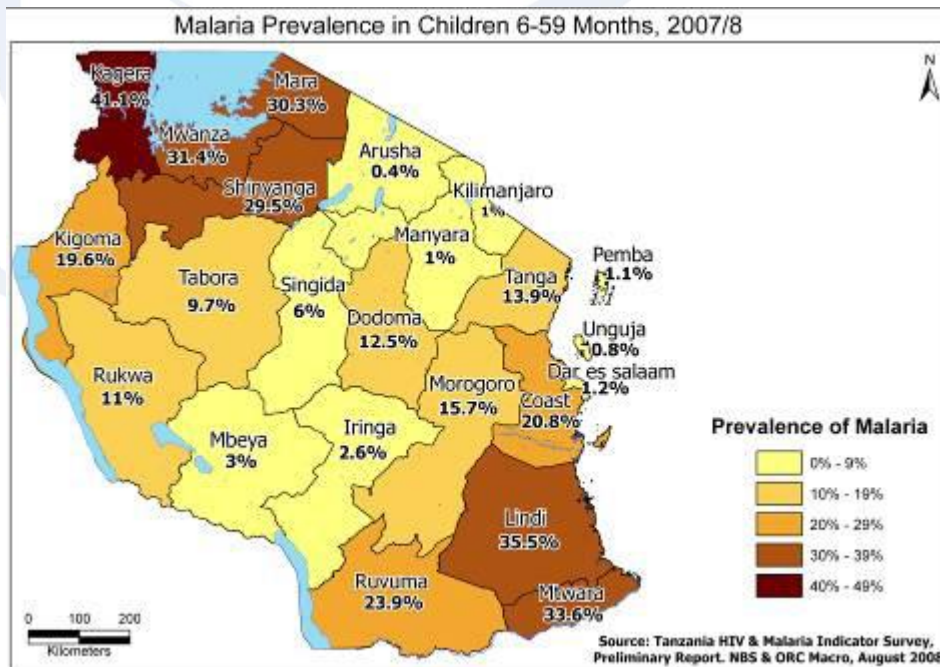
- 40% of all outpatient attendance is attributable to malaria

- NMCP estimates that 70,000 malaria deaths occur annually among all ages

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Three-pronged approach to SBCC

1. Community-led activities

2. Rural Engagement Teams

3. Reinforcing media messages

Theoretical Guidance:
Extended Parallel Processing Model
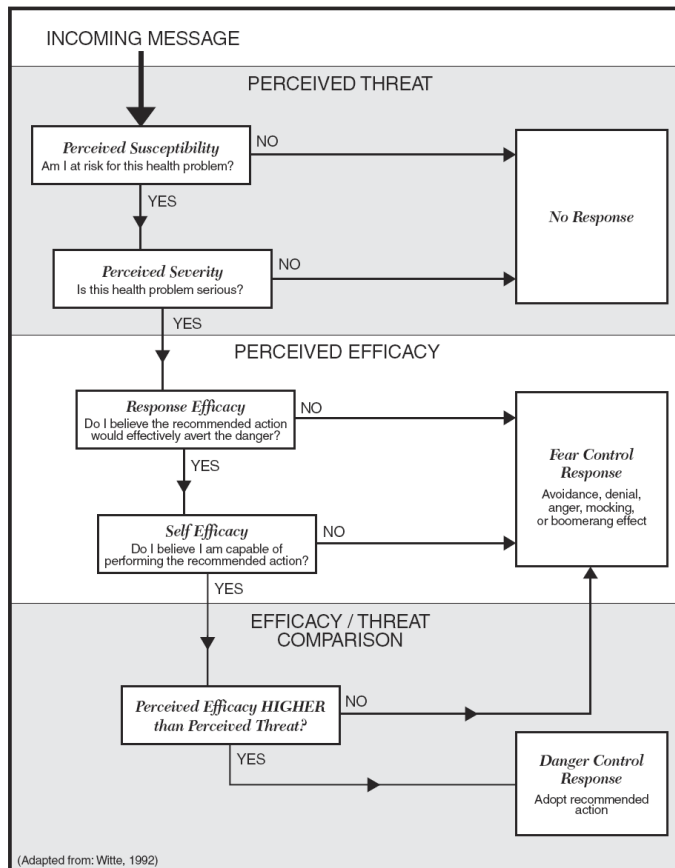
- **Susceptibility**: Many people get malaria
- **Severity**: Malaria is dangerous
- **Response efficacy**: ITNs help you avoid malaria
- **Self-efficacy**: You can obtain and use ITNs

Study Design

- Post-implementation household survey

- Data collected in Oct-Nov 2011

- 1200 households from 3 regions

Outcome of Interest:
Number of nets owned by the household

- Net use in Tanzania strongly determined by net ownership

- Net ownership reflects 3 behaviors:
  - Acquisition
  - Maintenance
  - Retention

- Converted to **Net Ratio** to adjust for household size

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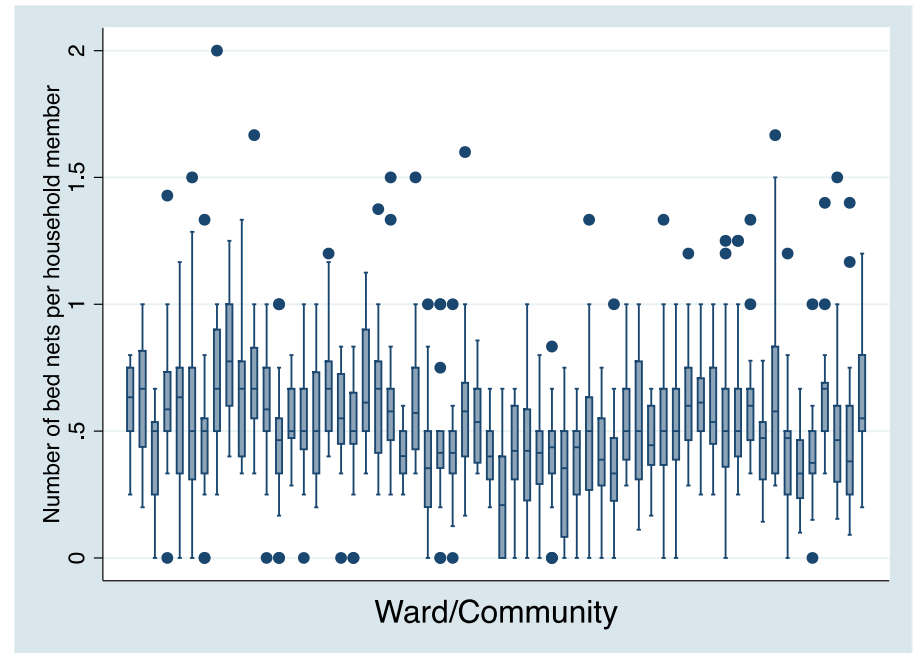
Evaluation Questions

Evaluation Question	Analytic Approaches
What effect did the COMMIT activities have on net ownership?	Treatment effects model
How did COMMIT activities influence net ownership?	Mediation Analysis

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These approaches require a binary measure of exposure to the intervention
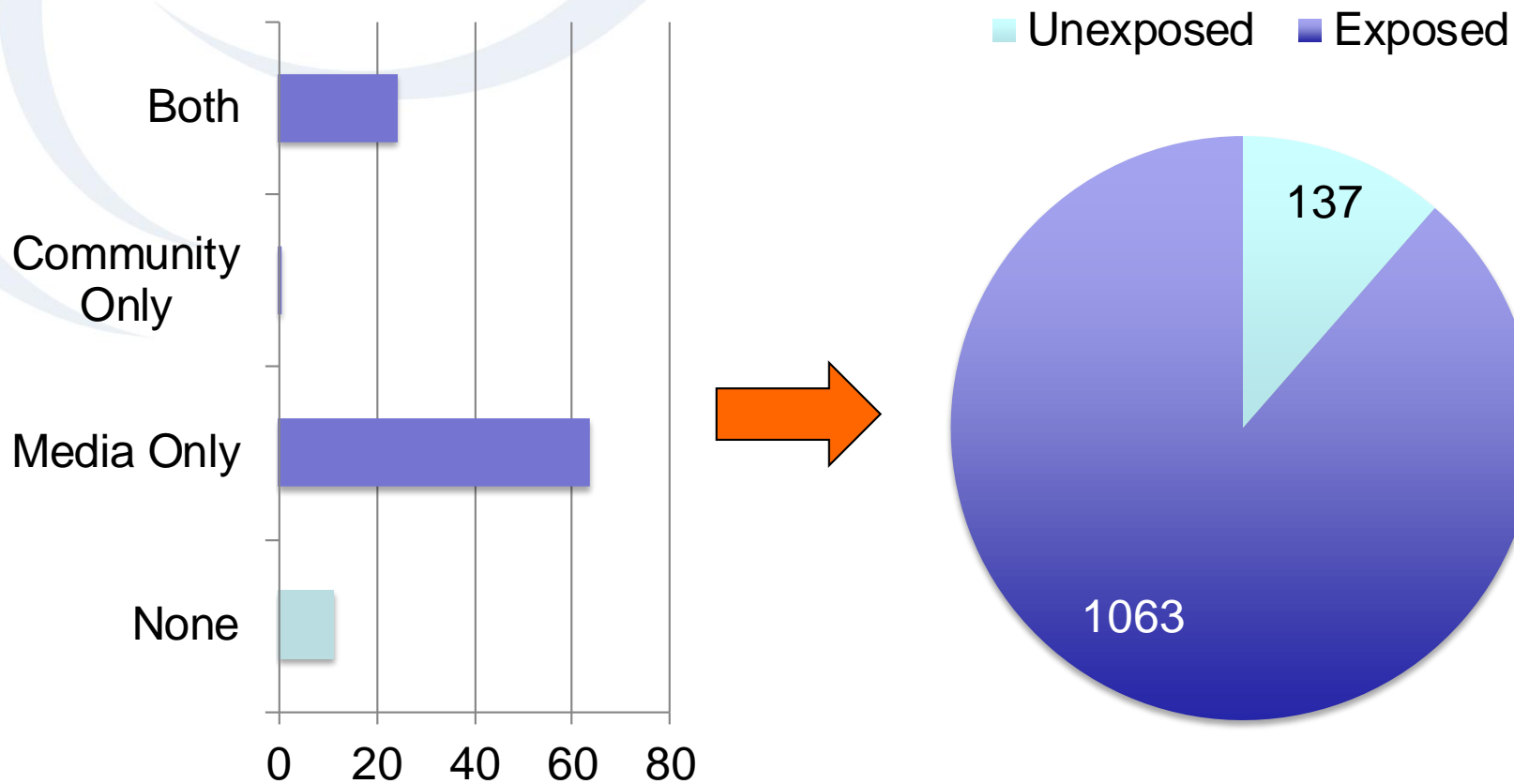
Treatment effect models estimate two equations simultaneously

| Exposure | = | Age, Education, Region, SES, etc. | + | Everything else that influences exposure |

rho

| Net Ownership | = | **Exposure**, Access to nets, etc. | + | Everything else that influences net ownership |
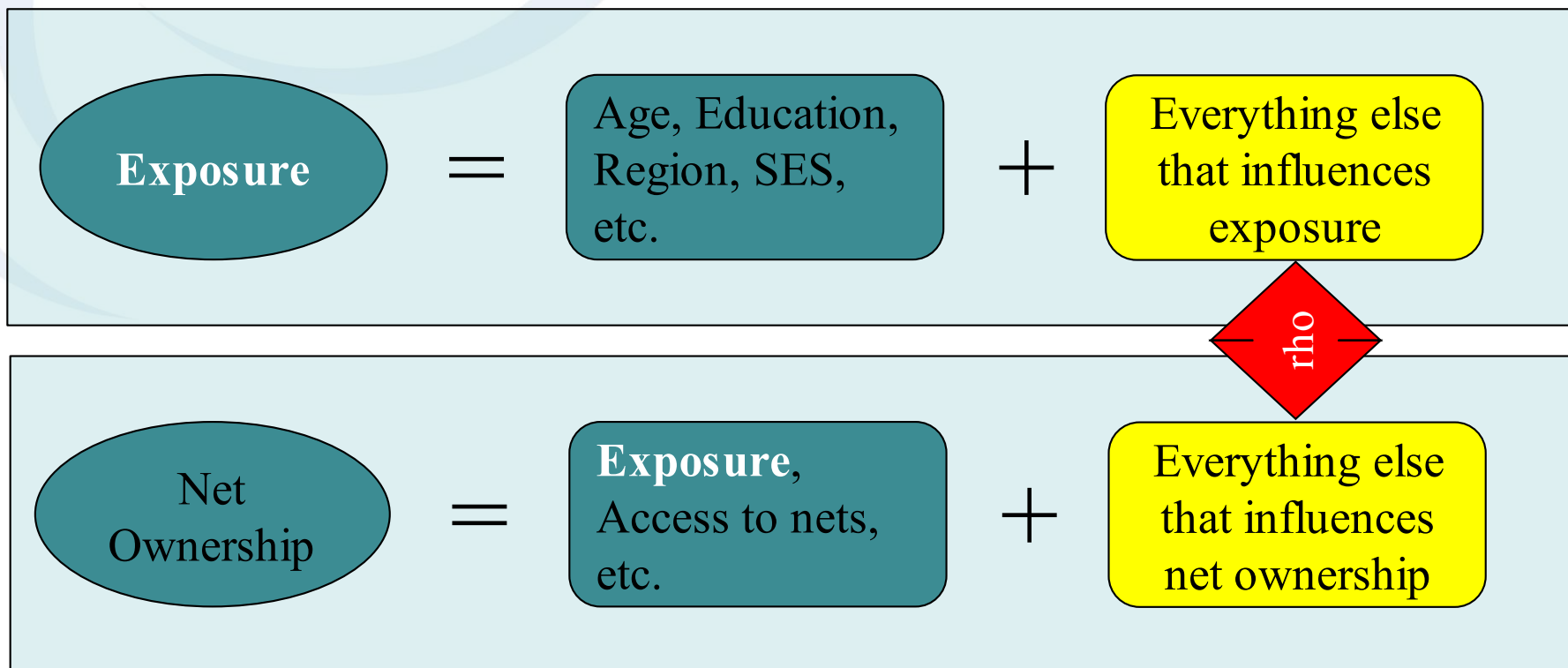
Measured Unmeasured

rho = correlation between residuals

Predicting exposure to COMMIT

Variable	Coefficient
Gender	-0.50**
Education (Ref = None)	
Primary	0.24*
Greater than Primary	0.89*
SES quintiles (Ref = Lowest)	
Lower	0.19
Middle	0.16
Higher	0.54*
Highest	0.43
Frequency of Newspaper Reading	0.18***
Frequency of Radio Listening	0.37
Frequency of Television Viewing	0.52
Region (Ref = Lindi)	
Rukwa	-0.52***
Mwanza	0.25
Own a radio	0.58***
Own a television	0.19
Constant	1.38
r2	0.28

Predicting household net ratio

Variable	Coefficient
Number of children under the age of 8	-0.04***
Average number of nets in the Kata	0.15***

Education (Ref = None)
    Primary
    Greater than Primary
	0.06***
	0.11***

Region (Ref = Lindi)
    Rukwa
    Mwanza
	-0.07***
	-0.08***

Exposure to Commit	0.09*
Constant	0.129
rho = -0.11 Test that rho = 0; p= 0.324	

ATE

Mediation Analysis
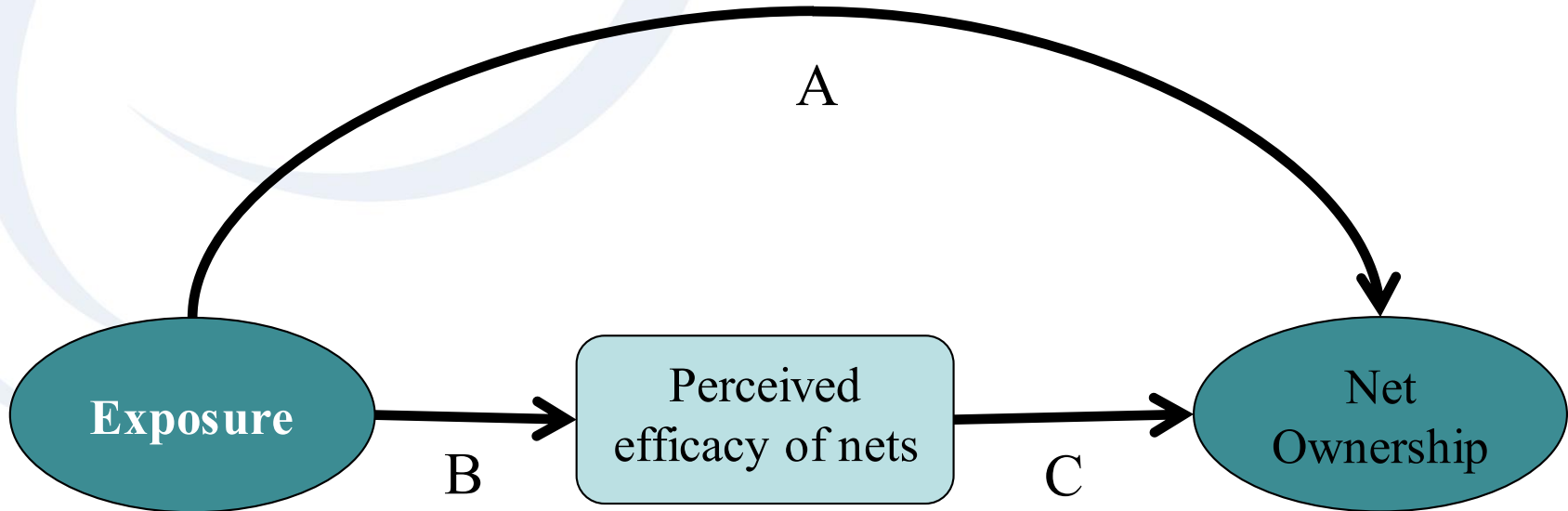
Direct Effect = A

Indirect Effect = B * C

Total Effect = A + (B * C)

Regression coefficients from multivariate model predicting Net Ratio

Potential Mediator	Regression Coefficient
Perceived threat index	-0.017**
Self efficacy	0.036***
Response efficacy	0.001
Perceived comfort of bed nets	0.009

Models included: number of children under 8 in HH, Education, SES, Region of residence, and Average number of bed nets owned by households in the ward
P-value: *p<0.05; **p<0.01; ***p<0.001

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Direct, Indirect and Total Effects of Exposure on Net Ratio

Total Effect	**0.049**
Direct Effect	**0.028**
Indirect Effect	**0.020**
Perceived threat	-0.001
Self-efficacy	0.019***
Response efficacy	0.001
Perceived comfort of bed nets	0.002
Proportion of total effect mediated	**41.7**

Models included: number of children under 8 in HH, Education, SES, Region of residence, and Average number of bed nets owned by households in the ward

P-value: *p<0.05; **p<0.01; ***p<0.001 (developed using a bootstrap approach with 2000 iterations)

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Conclusion

- Net ownership appears to reflect both access and HH decision-making

- Exposure to the Commit messaging responsible for an increase in the household net ratio

- The effect of exposure is primarily mediated through increased self-efficacy to obtain and use bed nets.