# VULNERABILITY TO URBAN POVERTY: PROFILING AND MODELING THE DETERMINANTS OF POVERTY AMONG URBAN HOUSEHOLDS IN MALAYSIA

Dissertation submitted by

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# OUTLINE

- INTRODUCTION
- LITERATURE REVIEW
- METHODOLOGY
- FINDINGS & ANALYSIS
- CONCLUSIONS & RECCOMENDATIONS
- REFERENCES

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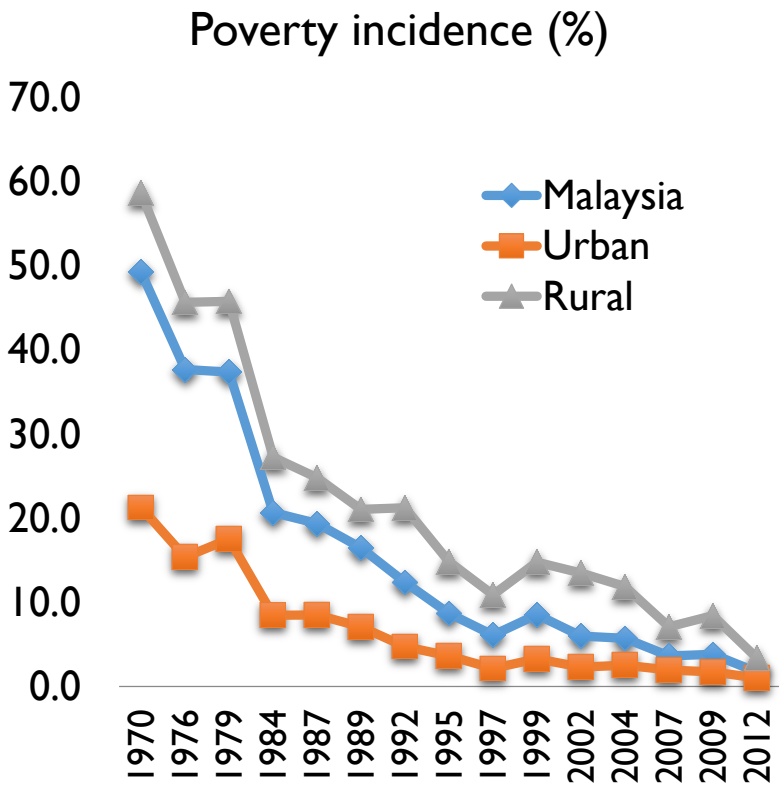
# BACKGROUND

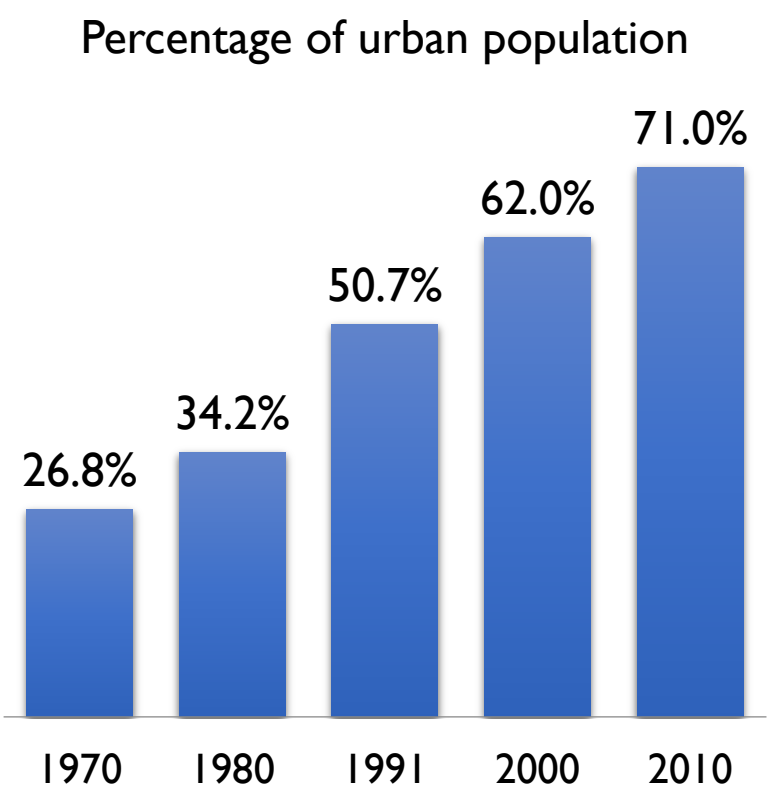
| | |
|---|---|
| Poverty in general | • Widespread<br>• Multifaceted<br>• Subjective |
| Broad definition | • Economic well-being<br>• Capability<br>• Social exclusion |
| Approaches in measuring poverty | • Absolute<br>• Relative |
| Poverty around the world | • Sub-Sahara<br>• Europe<br>• East Asia |

# BACKGROUND (cont'd)

Absolute poverty incidence in Malaysia declined considerably.




The proportion of urban population increased.




- Socio-economic pull-and-push factors have caused urban to be highly densely populated.
- Competition for space and resources gradually widen the income gap.

# PROBLEM STATEMENT

Malaysia reduced absolute poverty from 49.3% in 1970 to 1.7% in 2012 and proportion of urban population increase to 71% in 2010

Increase in competitiveness resulted in rapid socioeconomic development of urban centres and consequently impacted the cost of living of the urban households.

Diverse socio-demographic characteristic of the urban households caused large income gap between those with high income and the rest of the households.

There exist new forms of relative poverty i.e. disadvantaged households in the urban areas. To ignore these groups may cause a widening gap in the income distribution and consequently increase inequality.

Household Income Survey (HIS) is used by the Government to obtain the overview of poverty status in Malaysia, yet it has never been used to look into the risk factor of poverty.

It is imperative to examine the socioeconomic characteristics of households in the urban areas and identify the determinants of urban poverty using HIS.

# RESEARCH QUESTIONS

1. What is the demographic and socioeconomic profile of urban households' income?
2. Is there any significant difference in the average household income across various households' socioeconomic characteristics?
3. Are there any one or more factors that contribute significantly towards the likelihood of an urban household to fall into poverty?
4. How does each of the identified factors independently affect the likelihood of an urban household to fall into poverty?
5. What is the likelihood of an urban household to fall into poverty?

# RESEARCH OBJECTIVES

1. To profile the demographic and socioeconomic attributes of urban households based on the level of household income.
2. To compare the urban household income across various households' socioeconomic characteristics.
3. To identify factors that contribute significantly towards the likelihood of an urban household to fall into poverty.
4. To predict the likelihood of an urban household to fall into poverty

# SCOPE & LIMITATIONS

## Timeliness of the data

- Latest data available→2012

## Selection of variables and unit of analysis

- Provision of secondary data
  - DOSM Micro Data Dissemination Policy

# SIGNIFICANCE OF THE STUDY

1. Identify poverty determinants.
2. Identify vulnerable groups.
3. Assist policy makers.
4. Reduce miss-targeting.

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# LITERATURE REVIEWS

## 1. Definitions of Poverty

| Author(s) (Year) | Objectives | Findings |
|---|---|---|
| **Waglé (2013)** | To study the degree of poverty and inequality across high income countries from the perspective of economic well-being. | ▪ The most strategic poverty measure is consistent and specifically operationalized.<br>▪ Economic well-being should be benchmarked against basic resources such as income and consumption. |
| **Ravallion (2012)** | To compare and contrast the use of absolute and relative poverty lines in measuring poverty. | ▪ Absolute poverty should remain central to monitor the poorest groups.<br>▪ Relative line should be adopted to identify the emergence of disadvantaged groups as a consequent of economic growth and widening inequality. |

# LITERATURE REVIEWS

## 1. Definitions of Poverty (cont'd)

| Author(s) (Year) | Objectives | Findings |
|---|---|---|
| **Laderchi, Saith, and Stewart (2003)** | To explore the differences and implications of four approaches in measuring poverty, i.e. monetary approach, capabilities approach, social exclusion and participatory approach. | ▪ All definitions of poverty contain some arbitrary and subjective elements.<br>▪ Since there are targeting and policy implications of the conceptualization, definition and measurement of poverty, combinations of methods and approaches should be adopted. |

# LITERATURE REVIEWS

## 2. Determinants of Poverty

| Author(s) (Year) | Objectives | Findings |
|---|---|---|
| **Huyser, Takei, & Sakamoto (2013)** | To identify the demographic factors that determines the poverty status of the native population in America and Alaska. | ▪ The odds of being poor is higher for American Indian as compared to non-Hispanic and Whites, when factored by age, gender, education, metropolitan status, and region of residence. |
| **Rahman (2013)** | To identify the factors which explain their relative effect on household poverty in Bangladesh. | ▪ There are higher likelihood of household poverty when heads are younger, female, possessed lower education, have members with disabilities, with higher percentage of female members or higher percentage of dependent within the households. |

# LITERATURE REVIEWS

## 2. Determinants of Poverty (cont'd)

| Author(s) (Year) | Objectives | Findings |
|---|---|---|
| **Mohan-Neill, Hoch, and Li (2013)** | To analyze the socioeconomic profile of US households based on gender and marital status of the heads. | Higher income and wealth is accumulated by a male-headed households or households with married heads. |
| **Awan, Malik, Sarwar, and Waqas (2011)** | To find out the effects of education on poverty. | Higher educational attainments reduce a person's risk to poverty. |
| **Chaudry, Malik, and ul Hasan (2009)** | To analyze the impact of households' socioeconomic and demographic characteristics on poverty. | Household poverty is influenced by household size, dependency ratio, and location, and characteristics of the head i.e. age, gender, educational attainment and types of occupation. |

# LITERATURE REVIEWS

## 2. Determinants of Poverty (cont'd)

| Author(s) (Year) | Objectives | Findings |
|---|---|---|
| **Peters (2009)** | To study the spatial distribution of poverty in America across geographic places and time periods. | ▪ 3,000 subcounties are classified into the High Poverty Group, accounting for 11 percent of the nation's poor.<br>▪ Households characteristics of this groups are higher rates of Minorities; work disabilities; single income earner; unemployment; and illiteracy. |
| **He, Webster, Wu, and Liu (2008)** | To investigate the emerging pattern and find the determinants of urban poverty in China. | Urban households most vulnerable to poverty are with unemployed; and with rural migrants. |
| **Anyanwu (2005)** | To indicate the magnitude of poverty across urban and rural in Nigeria as well as provide empirical evident and confirm poverty determinants. | Poverty in the urban areas is higher among households headed by female and less educated heads. |

# LITERATURE REVIEWS

## 2. Determinants of Poverty (cont'd)

| Author(s) (Year) | Objectives | Findings |
|---|---|---|
| **Khalid, Shahnaz, & Bibi (2005)** | To examine the incidence of food poverty in Pakistan at the national, and urban and rural level, as well as to identify its key determinants. | Poverty are negatively correlated to age of head, education, skills and asset ownership and positively correlated to household size. |
| **Kapungwe (2004)** | To profile the level, patterns and trends of poverty and identify groups that is vulnerable to poverty among Zambian households between the year 1991 and 1998. | ▪ Poverty incidence is associated with gender, education, employment status, employment sector, and place of residence of the household heads, as well as the household size.<br>▪ The vulnerable groups are indentified as household living in rural areas and the low cost high density urban areas, and are headed by members without education. |

# LITERATURE REVIEWS

## 3. Multinomial Logistic Regression Analysis

| Author(s) (Year) | Objectives | Findings |
|---|---|---|
| **Dutta and Kumar (2013)** | To look into the trends of poverty in rural India from asset-based approach; quantify vulnerability to poverty in the rural areas; and identify the determinants of poverty in India. | Households with more dependant members and fewer years of education are more vulnerable to poverty. |
| **Kimsun (2012)** | To better understand the dynamic of poverty and the determinants of chronic poverty in rural Cambodia. | Education of household head, agricultural land, livestock and social capital contribute significantly in reducing the likelihood of being always poor. |

# LITERATURE REVIEWS

## 3. Multinomial Logistic Regression Analysis (cont'd)

| Author(s) (Year) | Objectives | Findings |
|---|---|---|
| **El-Habil (2012)** | To apply multinomial logistic regression to real survey data with categorical response variable in order to investigate the risk to physical abuse against children in Palestine. | The classification accuracy of the model is 87 percent, proving it to be a good model to predict the risk to physical violence. |
| **Bayaga (2010)** | To assess the application of multinomial logistic regression in risk analysis. | The model fit adequately and is a practical model with classification accuracy exceeding 25 percent compared to the null model. This technique is useful in identifying the significant risk factors and ultimately predicts the relative risk. |

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## Research Design

- Quantitative → Descriptive & correlational research

## Data Source

- Secondary data → HIS 2012 conducted by DOSM
- 30 percent subsample with selected variables
- 7869 urban households, comprises of 32 339 members

## Data Description

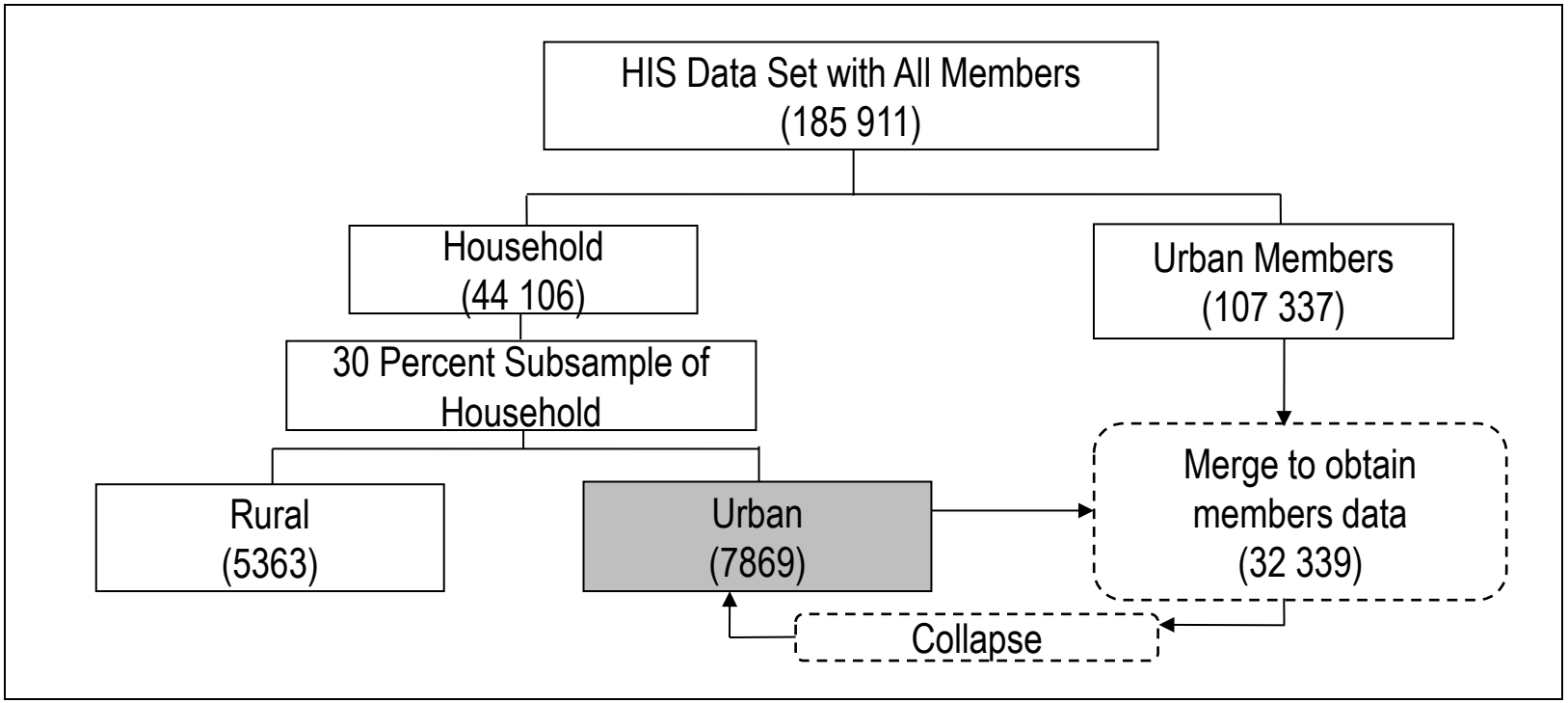
- Twelve variables obtained from the individual data set

# VARIABLES IN THE DATA SET

| No. | Variable | Level | Scale of Measures |
|---|---|---|---|
| 1 | Household ID | Household | n.a. |
| 2 | Household Members ID | Member | n.a. |
| 3 | Relationship to Household Head | Member | Categorical |
| 4 | Age | Member | Continuous |
| 5 | Gender | Member | Categorical |
| 6 | Marital Status | Head | Categorical |
| 7 | Educational Attainment | Head | Categorical |
| 8 | Employment Status | Head | Categorical |
| 9 | Income recipient | Member | Categorical |
| 10 | Occupation | Head | Categorical |
| 11 | Gross household income | Household | Continuous |
| 12 | Poverty Status | Household | Categorical |

# DATA MANAGEMENT & ORGANIZATION

## 1. Obtaining the 30% data set for the study

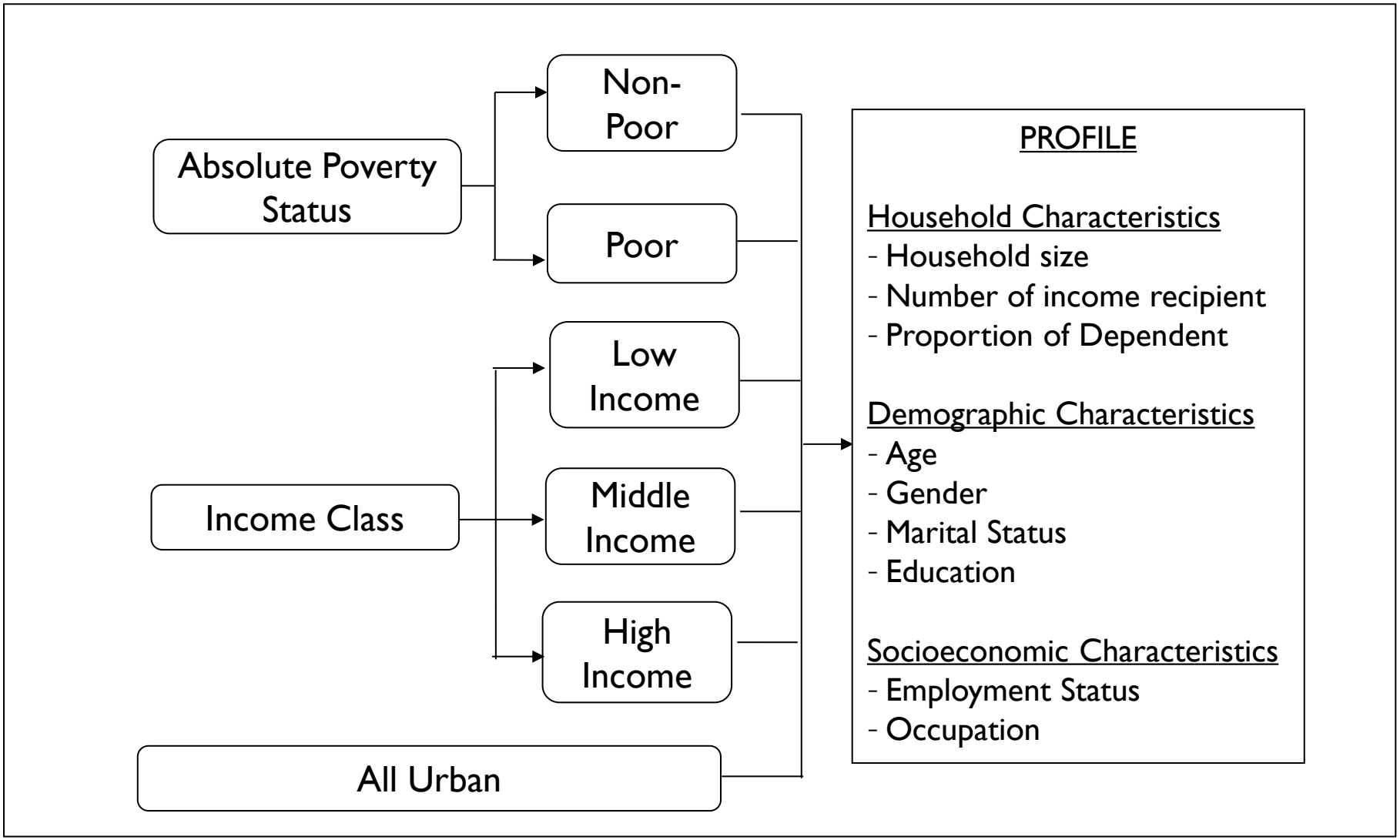



## 2. Selecting variables & generating new variables

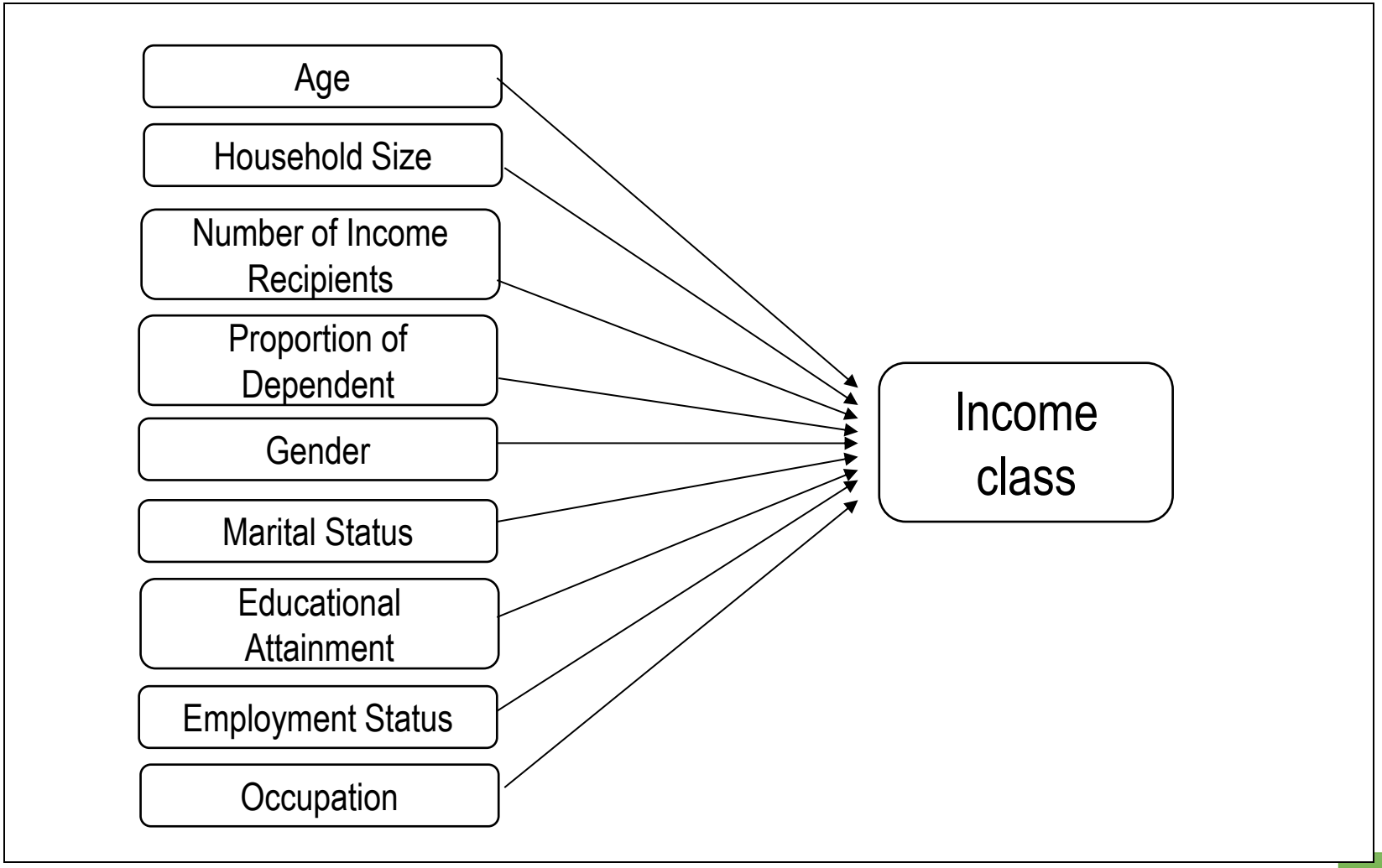
- Transformation of original variables
  - Continuous → Categorical
  - Collapsing Multi-categories categorical variables

- Generating new variables

# DIMENSIONS IN PROFILING THE URBAN HOUSEHOLDS



# CONCEPTUAL FRAMEWORK TO MODEL THE DETERMINANTS OF POVERTY



# DATA ANALYSIS APPROACH

| Tools & Softwares | |
|---|---|
| STATA 12 | Microsoft Excel |

## Exploratory data analysis

- Data screening

## Descriptive statistics

- Profile of urban households
- Tables & Charts

## Inferential statistics

- Identify determinants of poverty
- Multinomial logistic regression

# STEPS IN MULTINOMIAL LOGISTIC REGRESSION ANALYSIS

**Initial steps in model building**

| Multicollinearity | Sample size & number of predictors |
|---|---|

↓

**Specification of the model**

↓

**Evaluation of the Overall Model Fit**

Compare the Log Likelihood Ratio of the null model & specified model

↓

**Evaluation of the effect of the individual predictor to the overall model**

Likelihood Ratio Test

↓

**Evaluation of the significance of parameter estimates in the model**

Wald Chi Square Statistics

↓

**Proportional by Chance Accuracy of Classification**

25 percent improvement in the Final Model as compared to the Null Model

↓

**Interpretation of the model**

Take the multiplicative model

# SPECIFICATION OF THE MODEL TO IDENTIFY THE DETERMINANTS OF POVERTY

$$\text{logit}\left(\frac{\widehat{\pi_1}}{\widehat{\pi_3}}\right) = \alpha + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5 + \beta_6 x_6 + \beta_7 x_7 + \beta_8 x_8 + \beta_9 x_9 \quad (1)$$

$$\text{logit}\left(\frac{\widehat{\pi_2}}{\widehat{\pi_3}}\right) = \alpha + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5 + \beta_6 x_6 + \beta_7 x_7 + \beta_8 x_8 + \beta_9 x_9 \quad (2)$$

## Response

**Income Class**

- Low income ($\pi_1$)
- Middle income ($\pi_2$)
- High income ($\pi_3$)

## Predictors

| | | |
|---|---|---|
| $x_1$ | : | Age of household head |
| $x_2$ | : | Household size |
| $x_3$ | : | Number of income recipients |
| $x_4$ | : | Dependent within a household |
| $x_5$ | : | Gender of household head |
| $x_6$ | : | Marital status of household head |
| $x_7$ | : | Education of household head |
| $x_8$ | : | Employment status of household head |
| $x_9$ | : | Occupation of household head |

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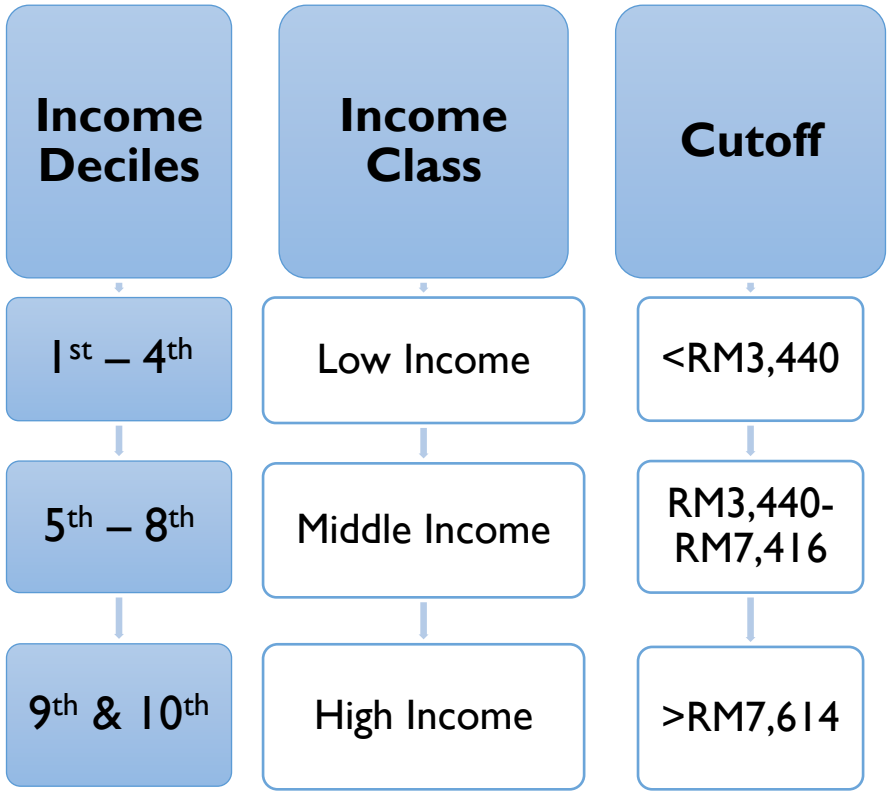
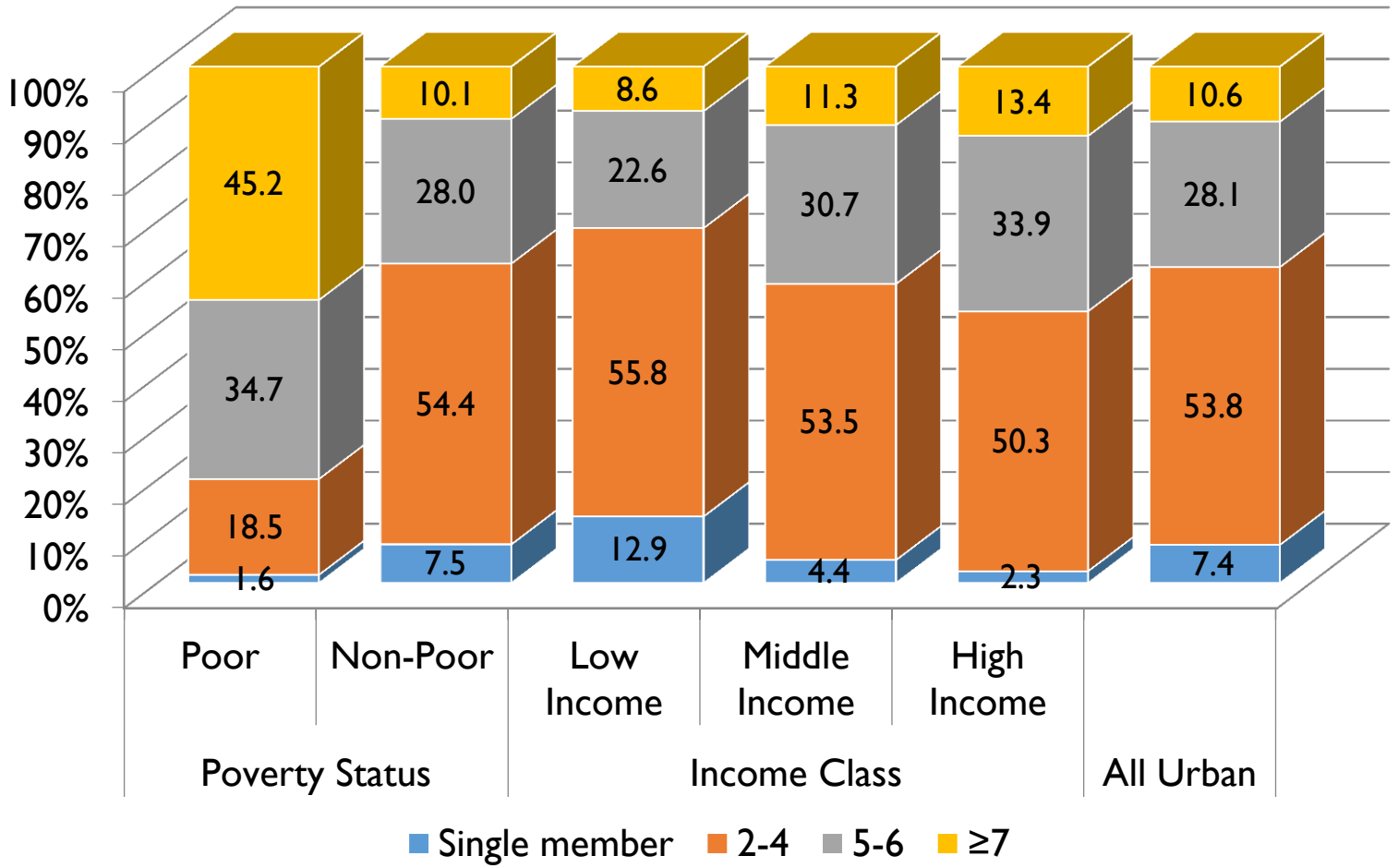
**Table 1:**
***Mean and Median Gross Income of Urban Households,2012***

| Household Status | Gross Household Income (RM) | |
|---|---|---|
| | Mean | Median |
| Absolute poverty status | | |
| Poor | 1,125 | 1,067 |
| Non-Poor | 5,713 | 4,168 |
| Income deciles | | |
| First | 1,075 | 1,128 |
| Second | 1,823 | 1,836 |
| Third | 2,487 | 2,482 |
| Fourth | 3,156 | 3,150 |
| Fifth | 3,773 | 3,774 |
| Sixth | 4,517 | 4,500 |
| Seventh | 5,468 | 5,461 |
| Eighth | 6,731 | 6,671 |
| Ninth | 8,907 | 8,836 |
| Tenth | 18,487 | 14,514 |
| All Urban | 5,641 | 4,112 |

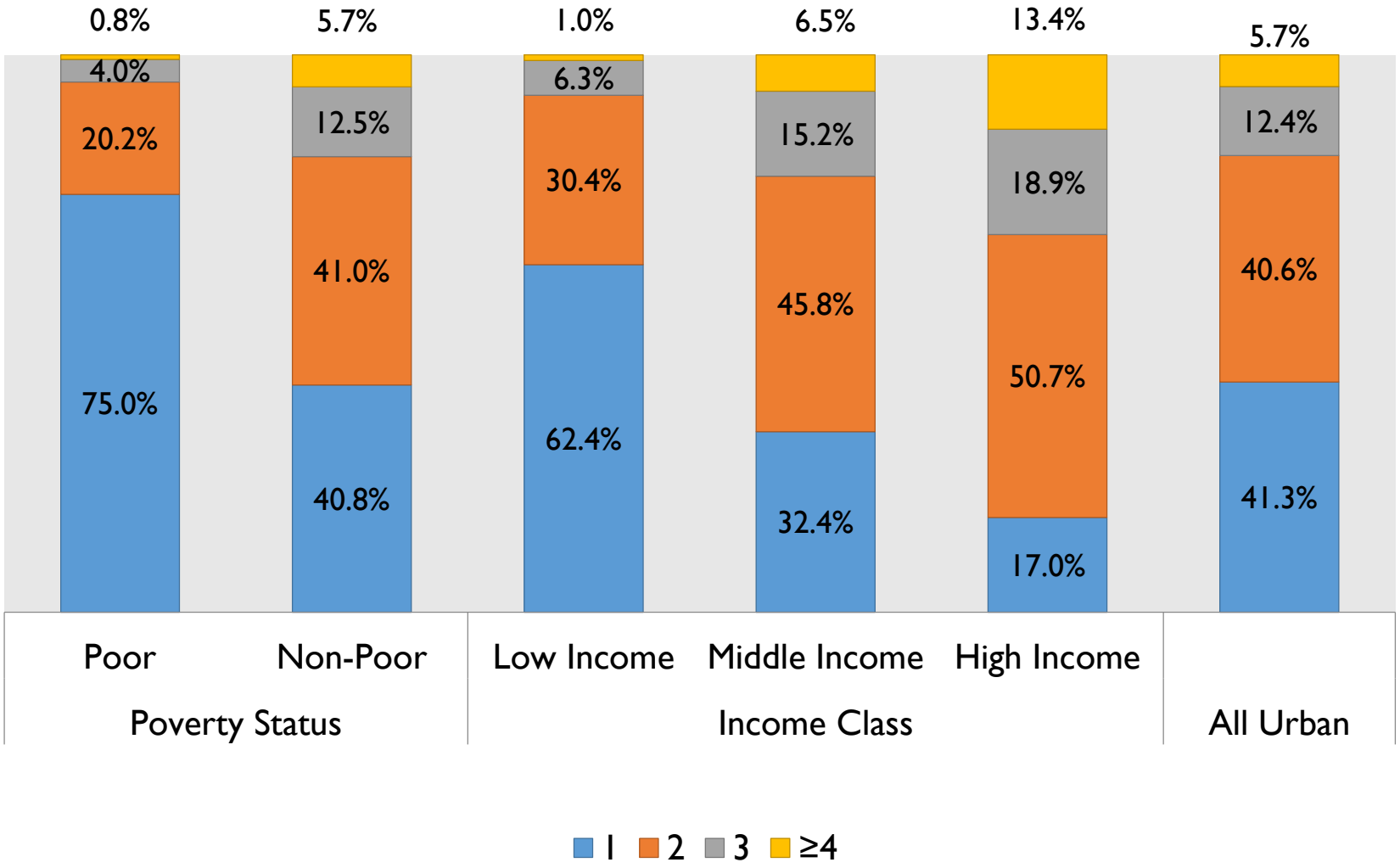
**Table 2:**
***Definition of Income Class and Cutoff of Gross Income for Urban Households, 2012***



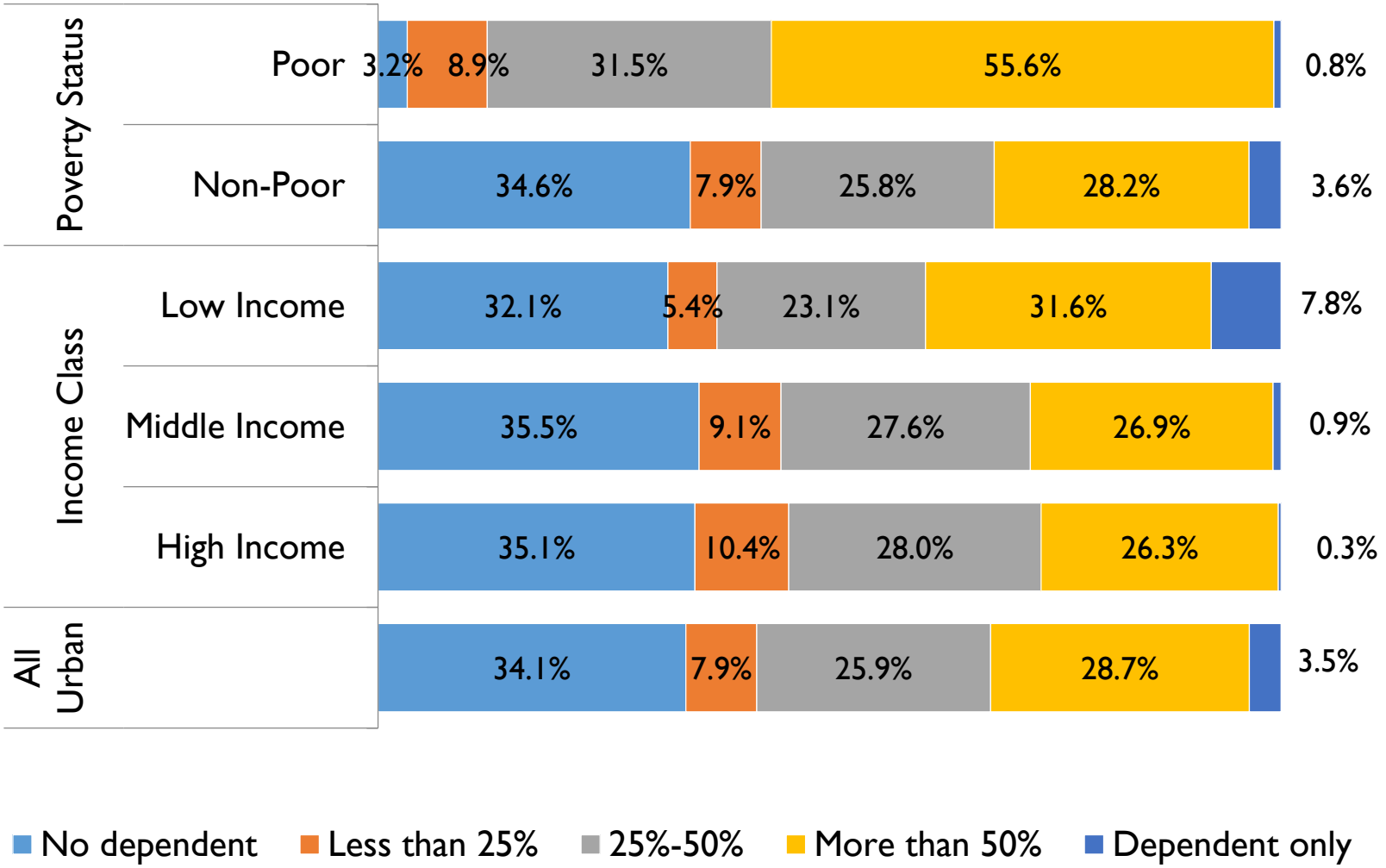
# Size of Urban Households



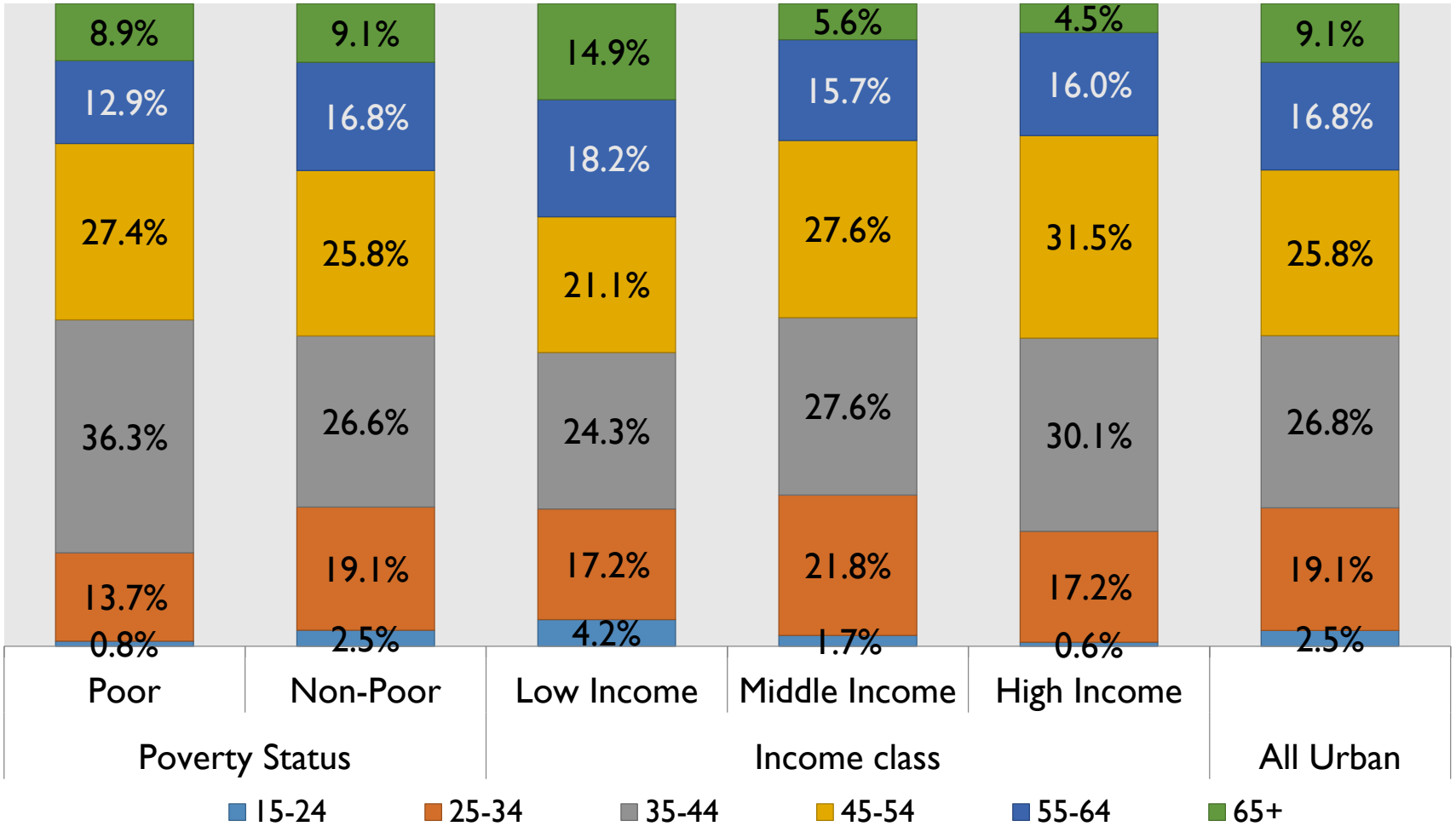
# Income Recipients in Urban Households



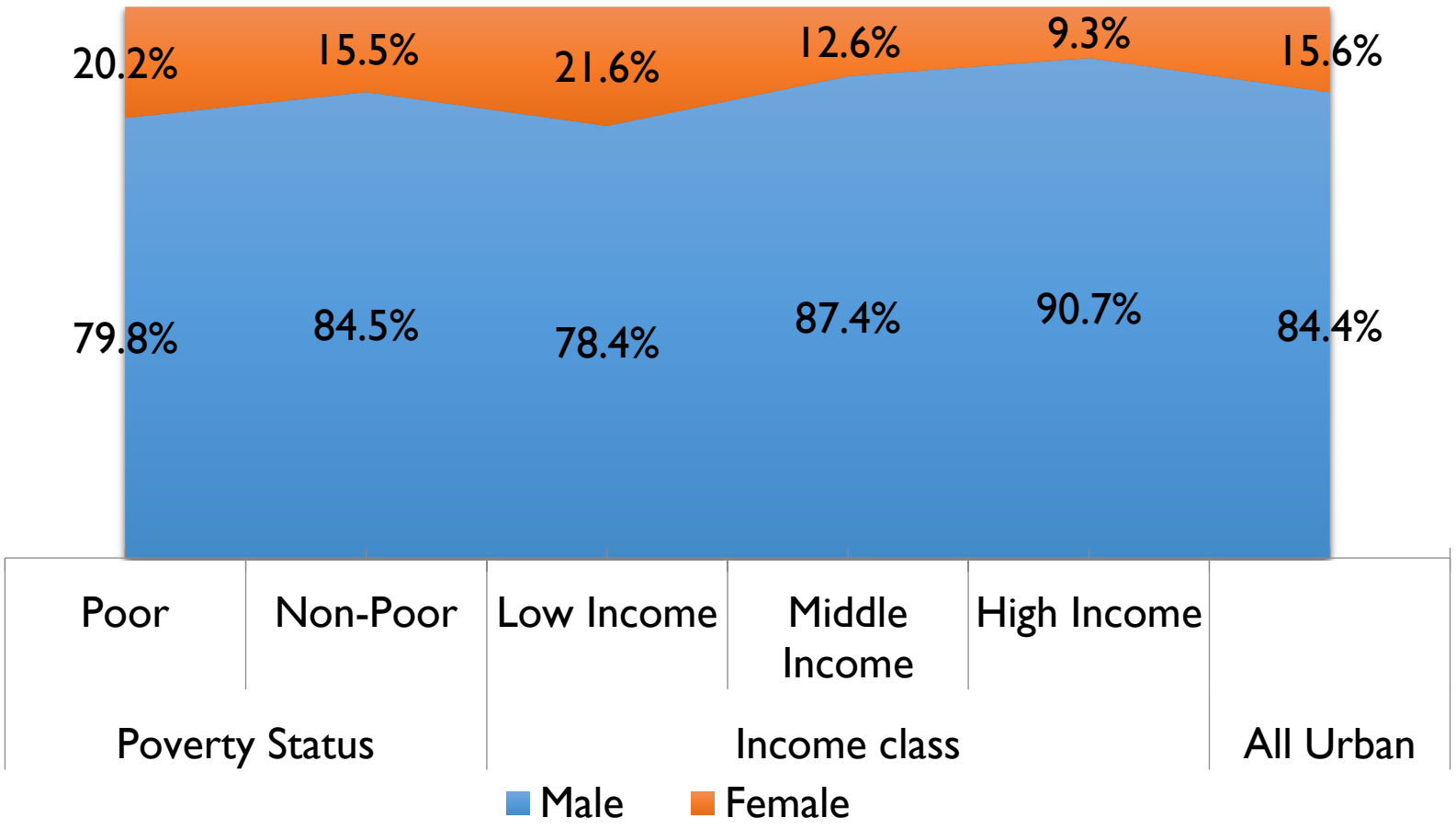
# Proportion of Dependents in Urban Households



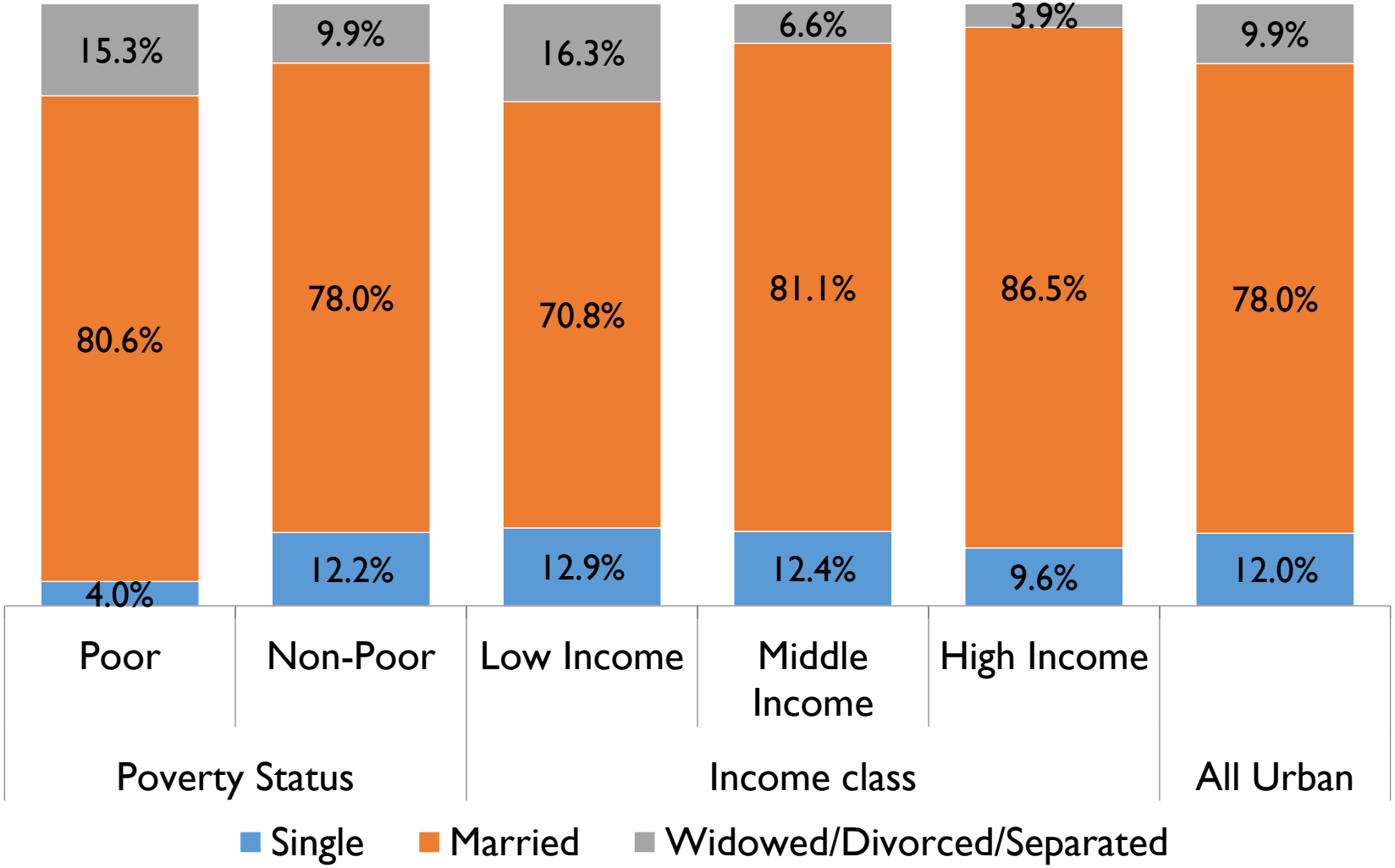
# Age Distributions of Urban Household Heads



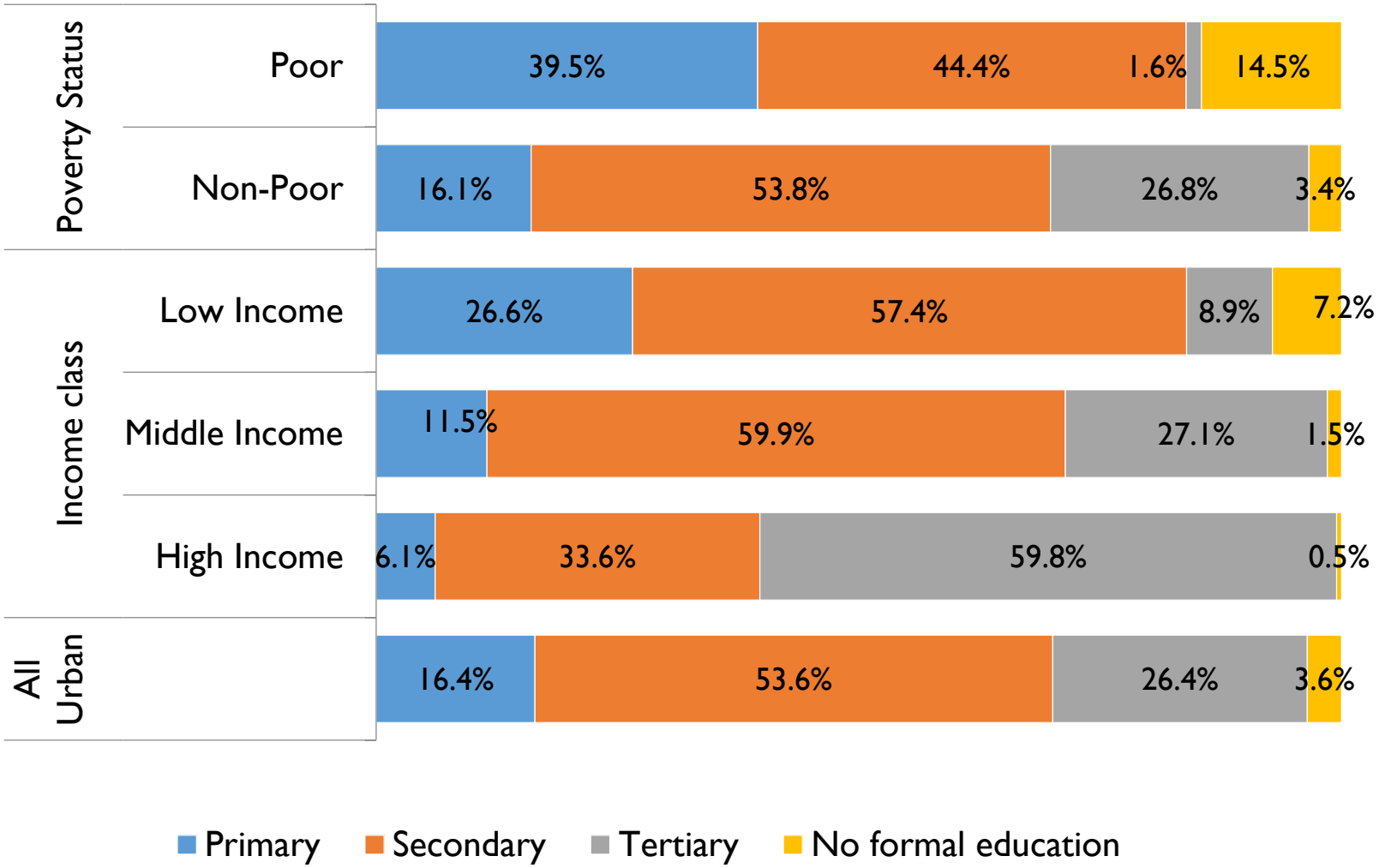
# Gender Distributions of Urban Household Heads



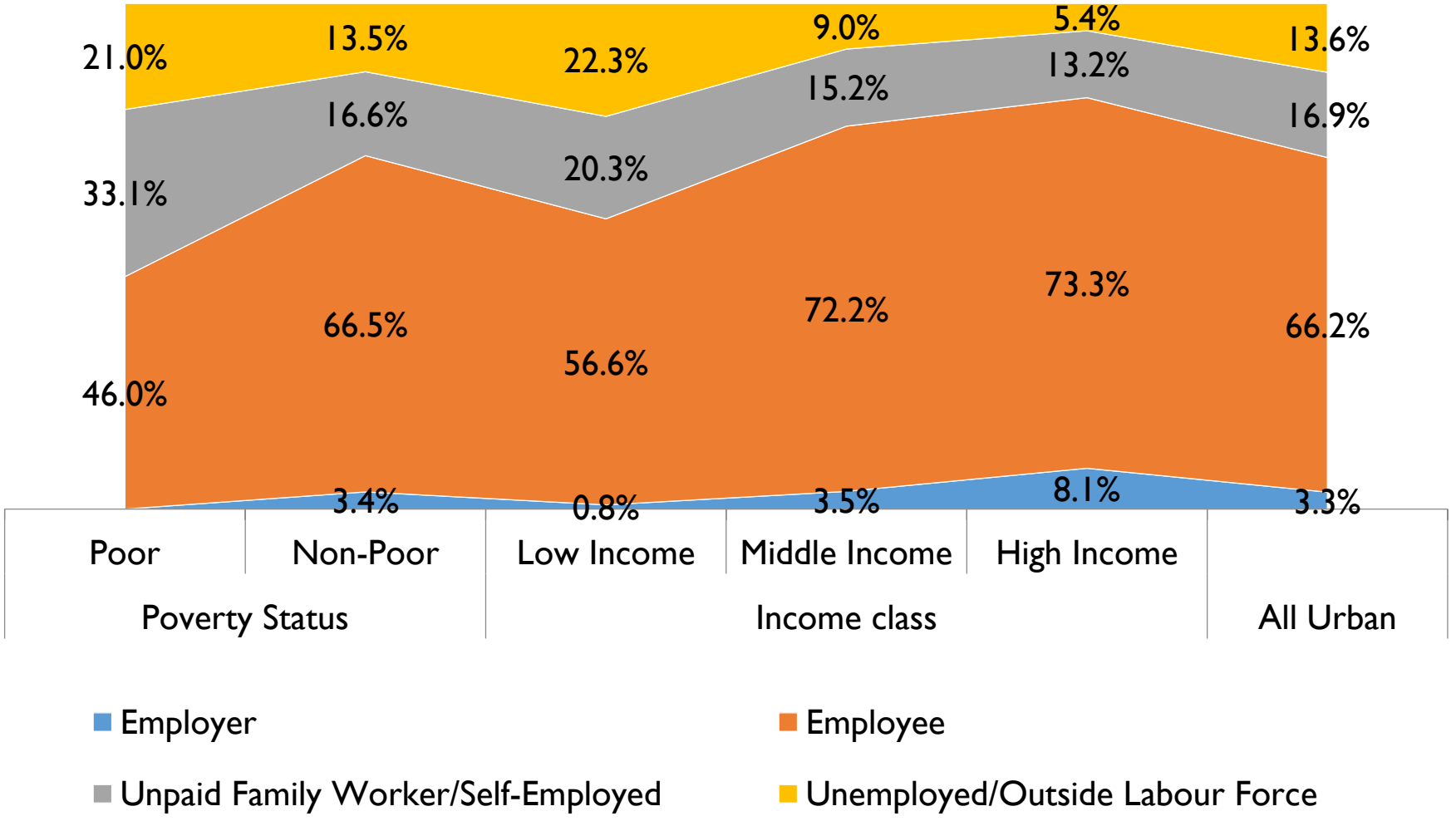
# Marital Status of Urban Household Heads



# Educational Attainment of Urban Household Heads



# Employment Status of Urban Household Heads



# Occupation of Urban Household Heads

| Occupation | Poverty Status | | Income class | | | All Urban |
|---|---|---|---|---|---|---|
| | Poor | Non-Poor | Low Income | Middle Income | High Income | |
| Outside Labour Force | 21.0% | 13.5% | 22.3% | 9.0% | 5.4% | 13.6% |
| Skilled | | | | | | |
| Managers | 0.0% | 8.9% | 1.0% | 7.1% | 27.7% | 8.8% |
| Professionals | 0.0% | 10.2% | 1.3% | 10.1% | 27.3% | 10.0% |
| Technician and Associate Professional | 2.4% | 13.5% | 6.8% | 18.1% | 16.7% | 13.3% |
| Medium & Low skilled | | | | | | |
| Clerical Support Workers | 0.8% | 5.2% | 4.5% | 6.7% | 3.4% | 5.1% |
| Service and Sales Workers | 18.5% | 18.0% | 20.6% | 19.3% | 10.0% | 18.0% |
| Skilled Agricultural, Forestry and Fishery Workers | 14.5% | 3.3% | 5.6% | 2.6% | 1.1% | 3.5% |
| Craft and Related Trades Workers | 16.1% | 9.3% | 11.9% | 9.8% | 3.8% | 9.4% |
| Plant and Machine Operators and Assemblers | 13.7% | 11.0% | 14.1% | 11.8% | 3.3% | 11.0% |
| Elementary Occupation | 12.9% | 7.1% | 11.8% | 5.4% | 1.3% | 7.2% |
| Total | 100% | 100% | 100% | 100% | 100% | 100% |

## Table 3: *Summary Profile of Urban Households by Income Class, 2012*

| Characteristics | Income Class | | |
|---|---|---|---|
| | Low Income | Middle Income | High Income |
| **Overall Characteristics** | | | |
| Average household size | 4.3 | 4.6 | 4.1 |
| % of households of seven or more members | 8.6% | 11.3% | 13.4% |
| Average number of income recipient | 1.5 | 2 | 2.3 |
| % of single income recipient households | 62.4% | 32.4% | 17% |
| % of dependent only households | 32.1% | 35.5% | 35.1% |
| Average dependent within a household | 34.5% | 26.9% | 26.1% |
| **Demographic Characteristics** | | | |
| Average age of household head | 47.7 | 44.6 | 45.3 |
| % of households with heads aged 65+ | 14.9% | 5.6% | 4.5% |
| % of female headed households | 21.6% | 12.6% | 9.3% |
| % of households with heads who are widowed/divorced/separated | 16.3% | 6.6% | 9.9% |
| % of households with heads with no formal education | 7.2% | 1.5% | 0.5% |
| **Demographic Characteristics** | | | |
| % of households with heads unemployed & outside Labour Force | 22.3% | 9% | 5.4% |
| % of households with heads working in medium & low skilled occupations | 68.6% | 55.6% | 23.0% |

## Evaluation of the Overall Model Fit

**Table 4:**
***Statistics for the Evaluation of Overall Model Fit***

| Statistics | Model | |
|---|---|---|
| | Intercept Only | Final Model |
| Log Likelihood | -8300.612 | -5953.878 |
| -2 Log Likelihood | 16601.224 | 11 907.756 |
| Likelihood Ratio (Chi-Square) | | 4693.468 |
| Degree of Freedom | | 24 |
| p-value | | 0.000 |

Note: The maximum likelihood estimation converge after five iteration

## Evaluation of the Effect of the Individual Predictor to the Overall Model

**Table 5:**
***Likelihood Ratio Tests Statistics of the Individual Predictors***

| Predictor | Chi-Square | Degree of Freedom | p-value |
|---|---|---|---|
| Age | 146.972 | 2 | 0.000 |
| Household Size | 8.282 | 2 | 0.016 |
| Number of Income Recipients | 1235.559 | 2 | 0.000 |
| Dependent | 17.272 | 2 | 0.000 |
| Female | 6.615 | 2 | 0.037 |
| Single | 37.671 | 2 | 0.000 |
| Widowed, Divorced or Separated | 14.892 | 2 | 0.001 |
| No Formal Education | 347.932 | 2 | 0.000 |
| Primary | 593.910 | 2 | 0.000 |
| Secondary | 401.589 | 2 | 0.000 |
| Unemployed & Outside Labour Force | 594.183 | 2 | 0.000 |
| Medium & low skill occupation | 839.133 | 2 | 0.000 |

| Income Class | Coefficient (B) | Wald Chi-Square | p-value | Exp (B) |
|---|---|---|---|---|
| Low Income | | | | |
| Age | -0.054 | 143.52 | 0.000 | 0.948 |
| Household Size | -0.011 | 0.16 | 0.688 | 0.989 |
| Number of Income Recipients | -1.933 | 938.20 | 0.000 | 0.145 |
| Dependent | 0.376 | 3.57 | 0.059 | 1.456 |
| Female | 0.383 | 6.00 | 0.014 | 1.466 |
| Single | 0.949 | 35.52 | 0.000 | 2.582 |
| Widowed, Divorced or Separated | 0.651 | 9.99 | 0.002 | 1.918 |
| No Formal Education | 5.523 | 152.77 | 0.000 | 250.390 |
| Primary | 3.946 | 457.53 | 0.000 | 51.747 |
| Secondary | 2.123 | 361.38 | 0.000 | 8.357 |
| Unemployed & Outside Labour Force | 4.153 | 467.42 | 0.000 | 63.593 |
| Medium & low skilled | 2.990 | 719.85 | 0.000 | 19.886 |
| Intercept | 2.690 | 126.34 | 0.000 | 14.731 |
| Middle Income | | | | |
| Age | -0.035 | 82.08 | 0.000 | 0.966 |
| Household Size | 0.039 | 2.72 | 0.099 | 1.040 |
| Number of Income Recipients | -0.808 | 279.89 | 0.000 | 0.446 |
| Dependent | -0.169 | 0.90 | 0.340 | 0.844 |
| Female | 0.187 | 1.85 | 0.175 | 1.205 |
| Single | 0.494 | 13.18 | 0.000 | 1.639 |
| Widowed, Divorced or Separated | 0.233 | 1.51 | 0.220 | 1.262 |
| No Formal Education | 2.644 | 38.07 | 0.000 | 14.066 |
| Primary | 1.905 | 140.19 | 0.000 | 6.721 |
| Secondary | 1.245 | 217.27 | 0.000 | 3.473 |
| Unemployed & Outside Labour Force | 1.974 | 138.30 | 0.000 | 7.197 |
| Medium & low skilled | 1.510 | 287.30 | 0.000 | 4.529 |
| Intercept | 2.272 | 135.96 | 0.000 | 9.703 |
| High Income | Reference Category | | | |

# INTERPRETATION OF THE MODELS

$$\frac{\hat{\pi}_1}{\hat{\pi}_3} = \exp\{2.69 - 0.054Age - 0.011Household\_Size - 1.933Income\_Recipient + 0.376Dependent + 0.383Female + 0.949Single + 0.651Widowed\_Divorced\_Separated + 5.523No\_Formal\_Education + 3.946Primary\_Education + 2.123Secondary\_Education + 4.153Outside\_Labour\_Force + 2.990Non\_manager\} \quad (3)$$

$$\frac{\hat{\pi}_2}{\hat{\pi}_3} = \exp\{0.233 - 0.0354Age + 0.039Household\_Size - 0.808Income\_Recipient - 0.169Dependent + 0.187Female + 0.494Single + 0.233Widowed\_Divorced\_Separated + 2.644No\_Formal\_Education + 1.905Primary\_Education + 1.245Secondary\_Education + 1.974Outside\_Labour\_Force + 1.51Non\_manager\} \quad (4)$$

# CLASSIFICATION ACCURACY OF THE MODEL

- Accuracy rate for the null model is 36%
- The proportional by chance accuracy rate is
  - (1.25 x 0.36) x 100% = 45%

**Table 6:**
***Classification of Prediction for the Final Model***

| Observed | Predicted | | | Total |
|---|---|---|---|---|
| | Low Income | Middle Income | High Income | |
| Low Income | 2,286 | 834 | 28 | 72.6% |
| Middle Income | 768 | 1,959 | 421 | 62.2% |
| High Income | 55 | 657 | 861 | 54.7% |
| Overall Percentage | 39.5% | 43.8% | 16.6% | 64.9% |

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# CONCLUSIONS

**Demographic & socioeconomic behaviours of a typical urban households**

| Income less than RM3,440 | Single income recipient |
| --- | --- |
| 1-4 members<br>• Most within dependency age | Head<br>• Male<br>• Married<br>• Age 35-54<br>• Primary or secondary educated<br>• Medium & low skilled occupations |

**Risk factors**

- Sociodemographic-economic factors
  - Age
  - Gender
  - Marital status
  - Education
  - Occupation
  - Number of income recipients

# RECCOMENDATIONS

## For poverty reduction

Different mechanism for different stages of poverty.

Education

- Equal access.
- Special and constant monitoring.
- Training and capacity building.

Proper identification

## To improve future study on poverty

Increase model's analytical power.

Investigate members' characteristics.

Accesibility of the whole sample

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"Poverty is the worst form of violence."
— **Mahatma Gandhi**

"As long as poverty, injustice and gross inequality exist in our world, none of us can truly rest."
— **Nelson Mandela**

# Thank you for your attention

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