SES AND HYPERTENSION

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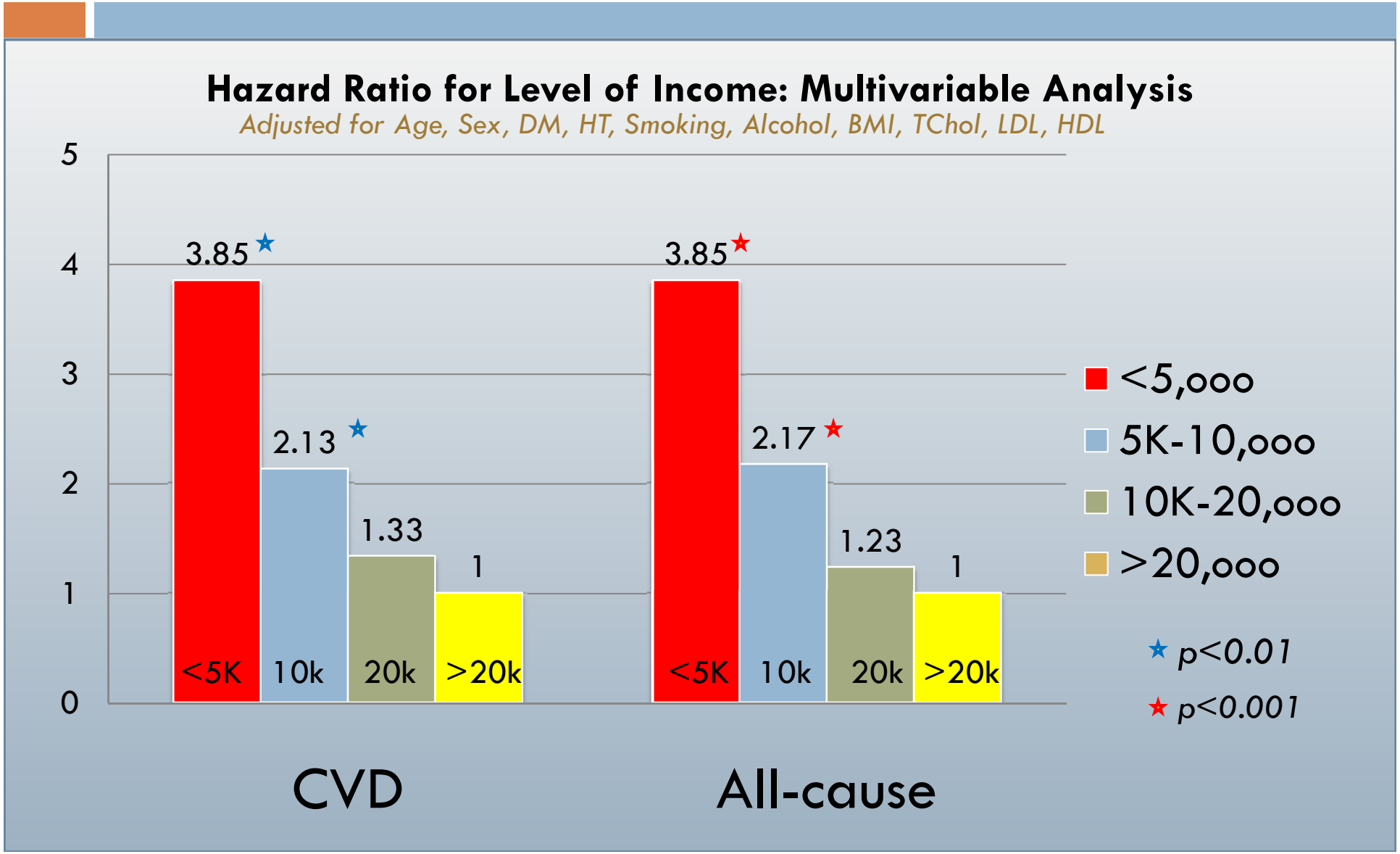
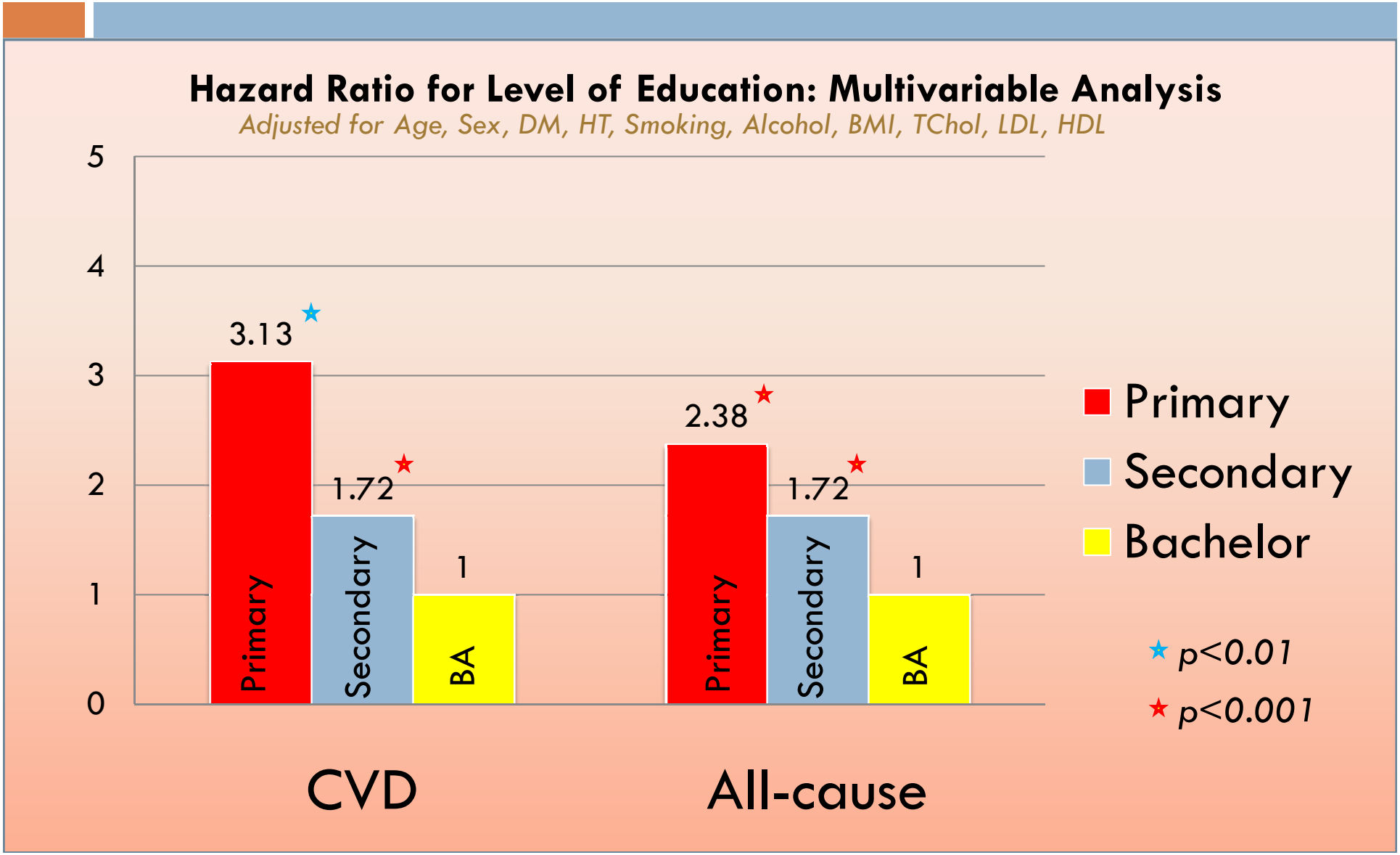
Background

- Socioeconomic status (SES) has impacts on health
- Lower SES poses health risks behavior and negative biological factors
- Hypertension is a major cardiovascular (CV) risk factor
- Whether SES affects incidence of hypertension is unknown

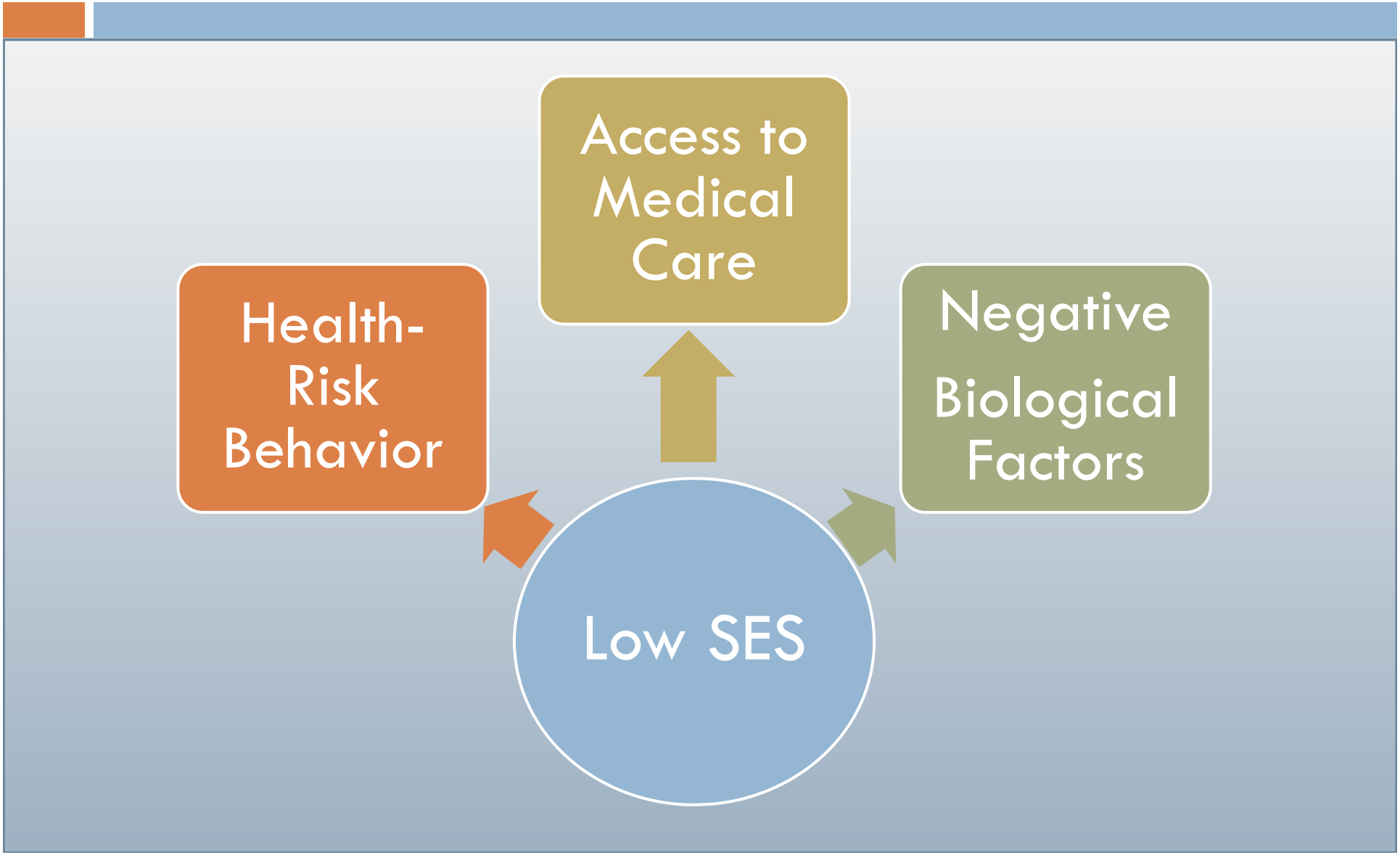
Level of Income & Mortality



Level of Education & Mortality



How SES affects outcome…

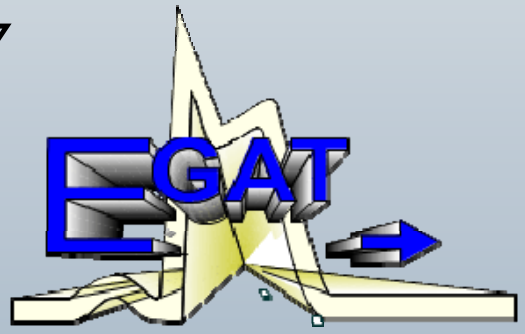


Objective

- To analyze effects of each socioeconomic parameter on prevalence of hypertension in a cohort study from Thailand

Method

- A cohort study
- 3,499 Participants from the Electricity Generating Authority of Thailand (EGAT) study: 22 years follow up
  - Completed SES data in 1985
  - Repeated surveys in 1997, 2002 and 2007
- Blood pressure measurement
- Socioeconomic measures
- Data analysis; Logistic regression model



Blood pressure measurement

- Sitting position / after 5-minute rest
- Calculated suitable cuff size
- 2 standard measurement by automatic machine
- Operated by trained nurses

Definition of Hypertension

- JNC 7
  - Systolic blood pressure ≥ 140 mmHg
  - Diastolic blood pressure ≥ 90 mmHg
  - Currently taking antihypertensive medication for at least 2 weeks
- Cross-sectional - prevalence in 1985
- Longitudinal – progression to HTN in 1997
- Longitudinal – Incidence rate over 22 years (1985-2007)

Socioeconomic status measures

*Level of Income (baht)	Level of Education	Occupational class
		

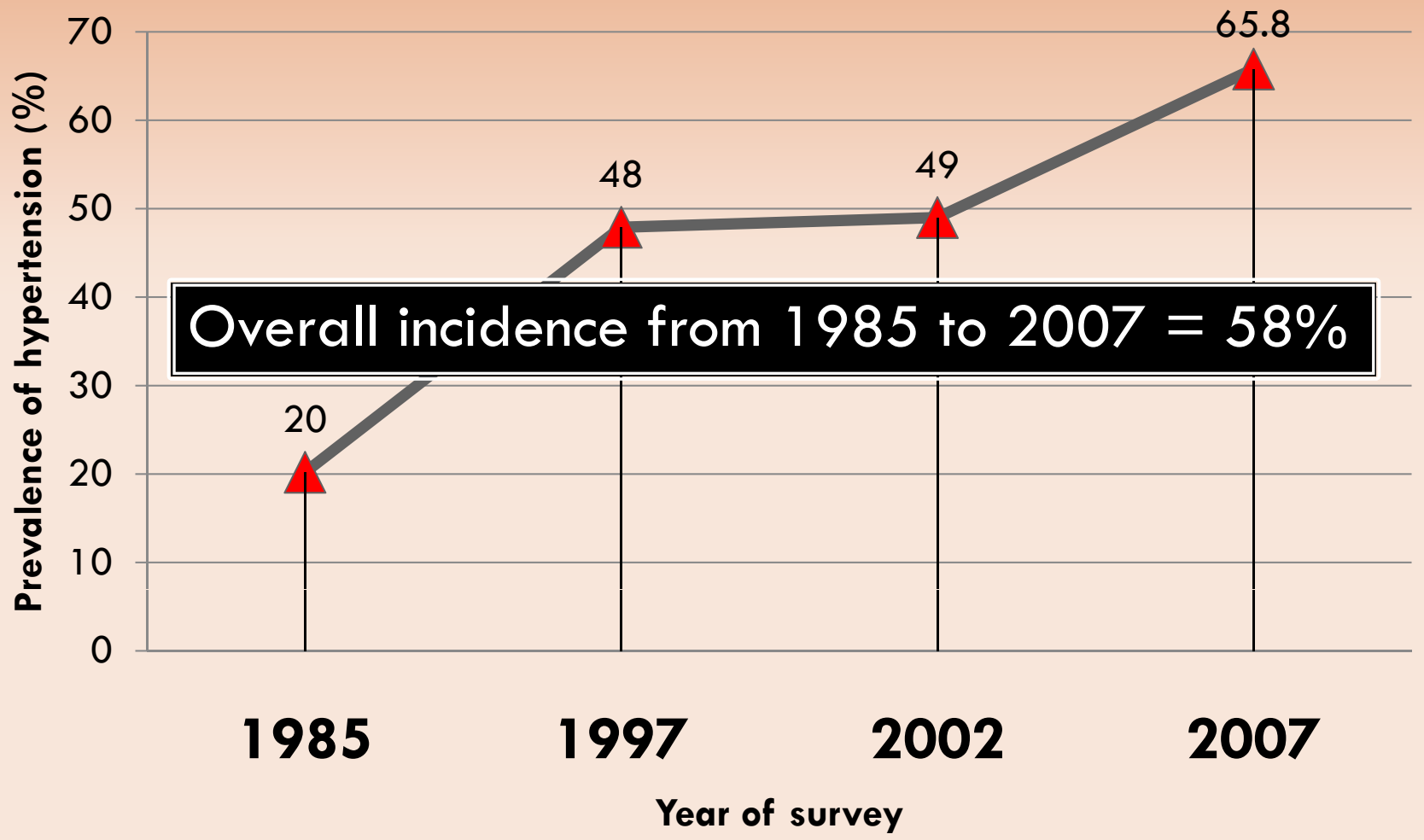
*Level of income in 1985 multiply by 2.25 = income in 2007 (Consumer Price Index; BOT)

Statistical Analysis

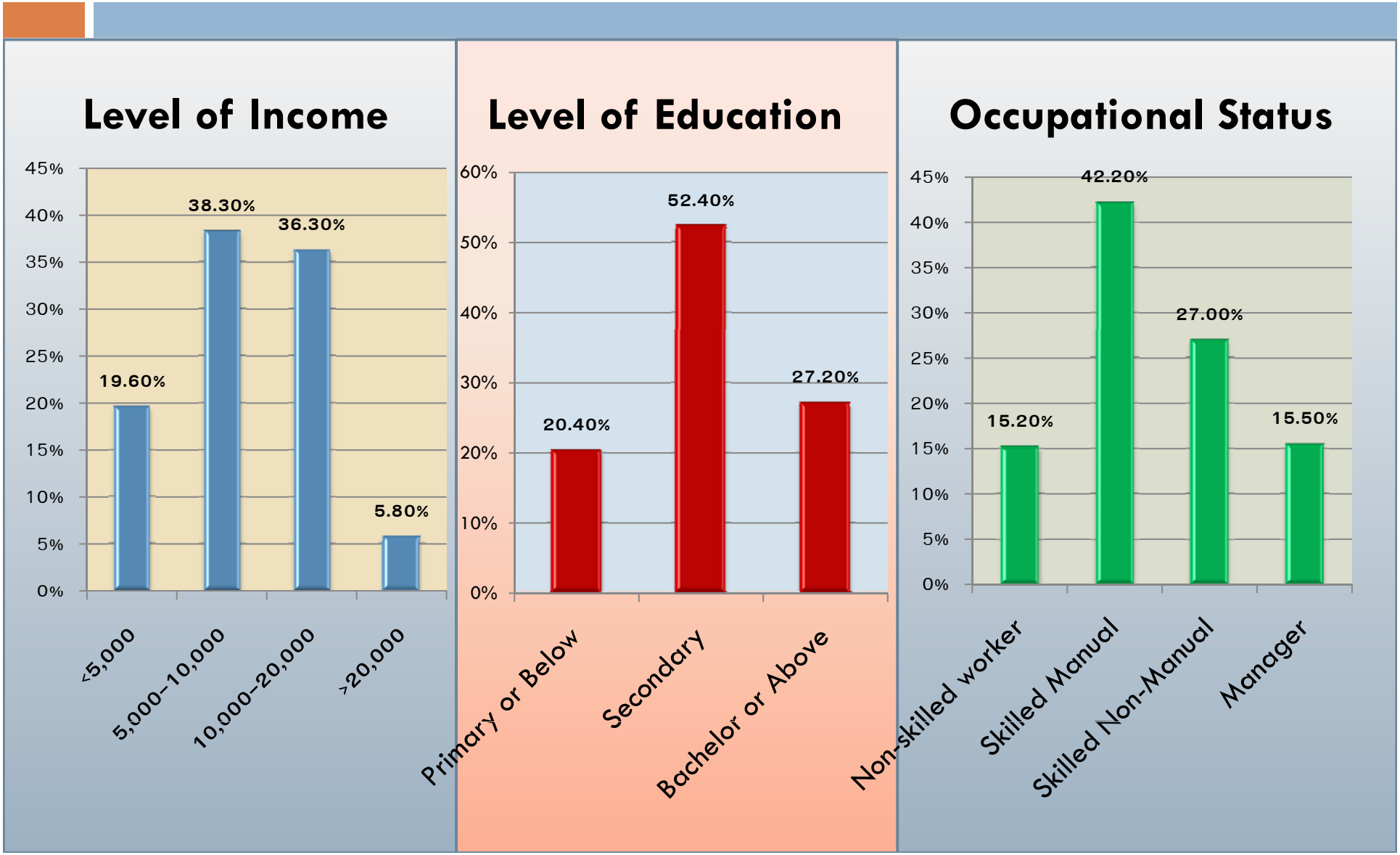
- Logistic model
  - prevalence in 1985
  - progression to HTN in 1997
- Cox-proportional hazard model
  - incidence rate over 22 years (1985-2007)
- Adjusted for age, sex, diabetes, HDL- and LDL-cholesterol, BMI, smoking status, alcohol consumption and physical activity in 1985

Results:

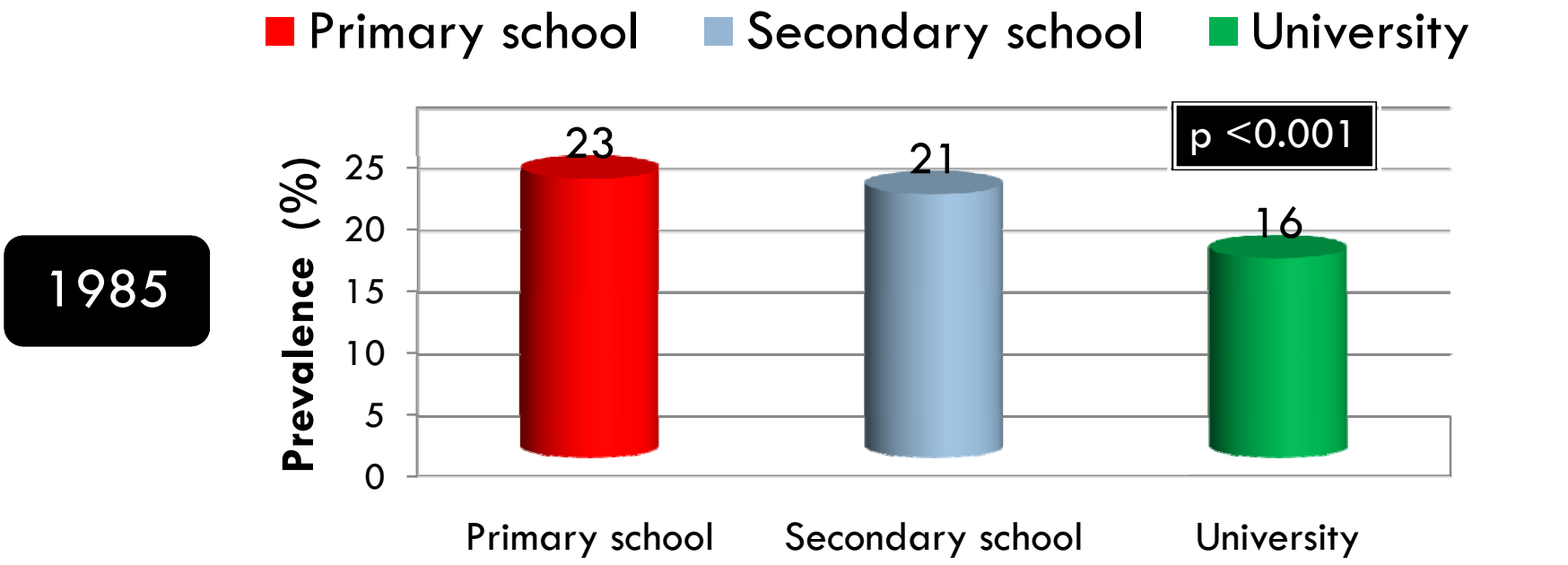
Prevalence of Hypertension by year of survey

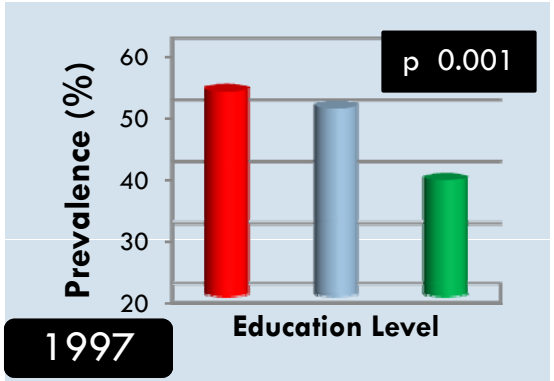


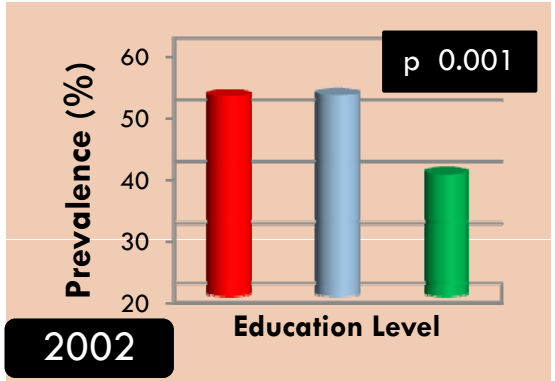
Distribution of SES

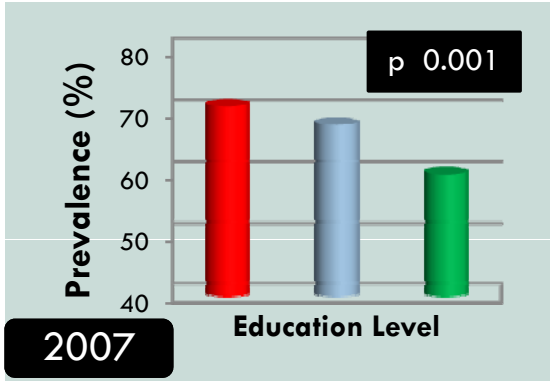


Prevalence of HT by Education Levels

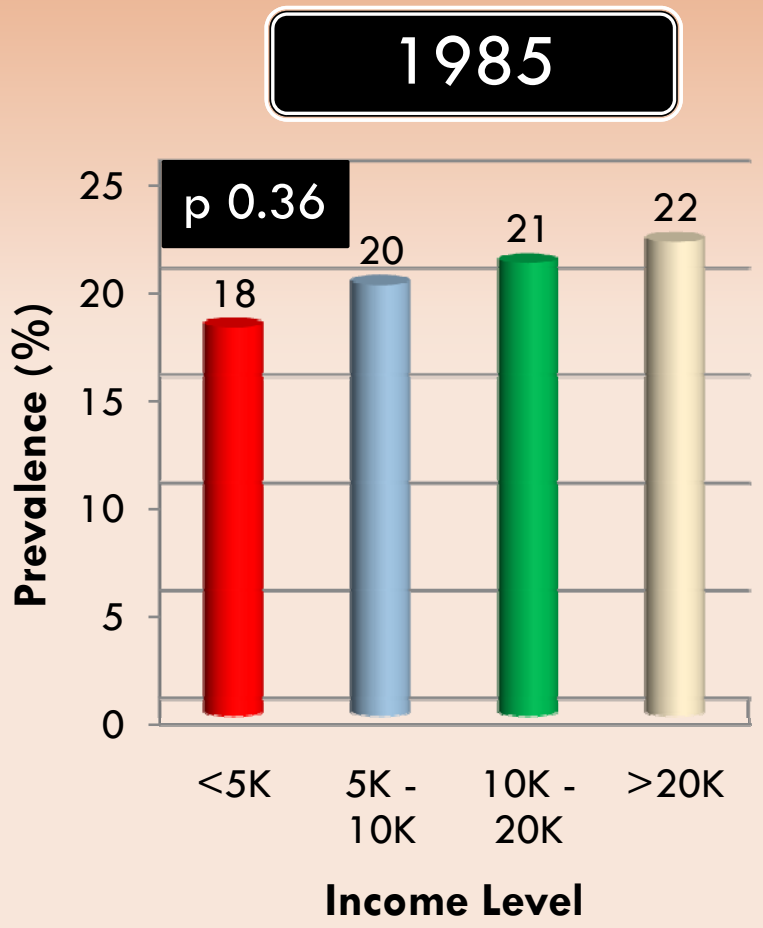


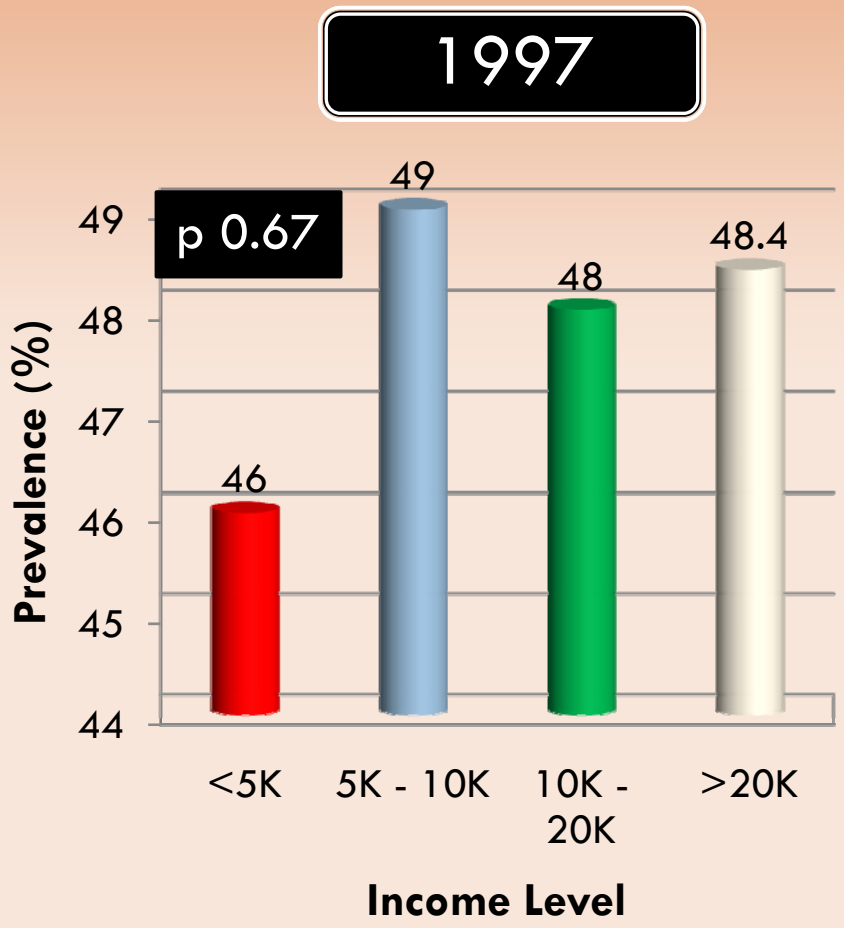




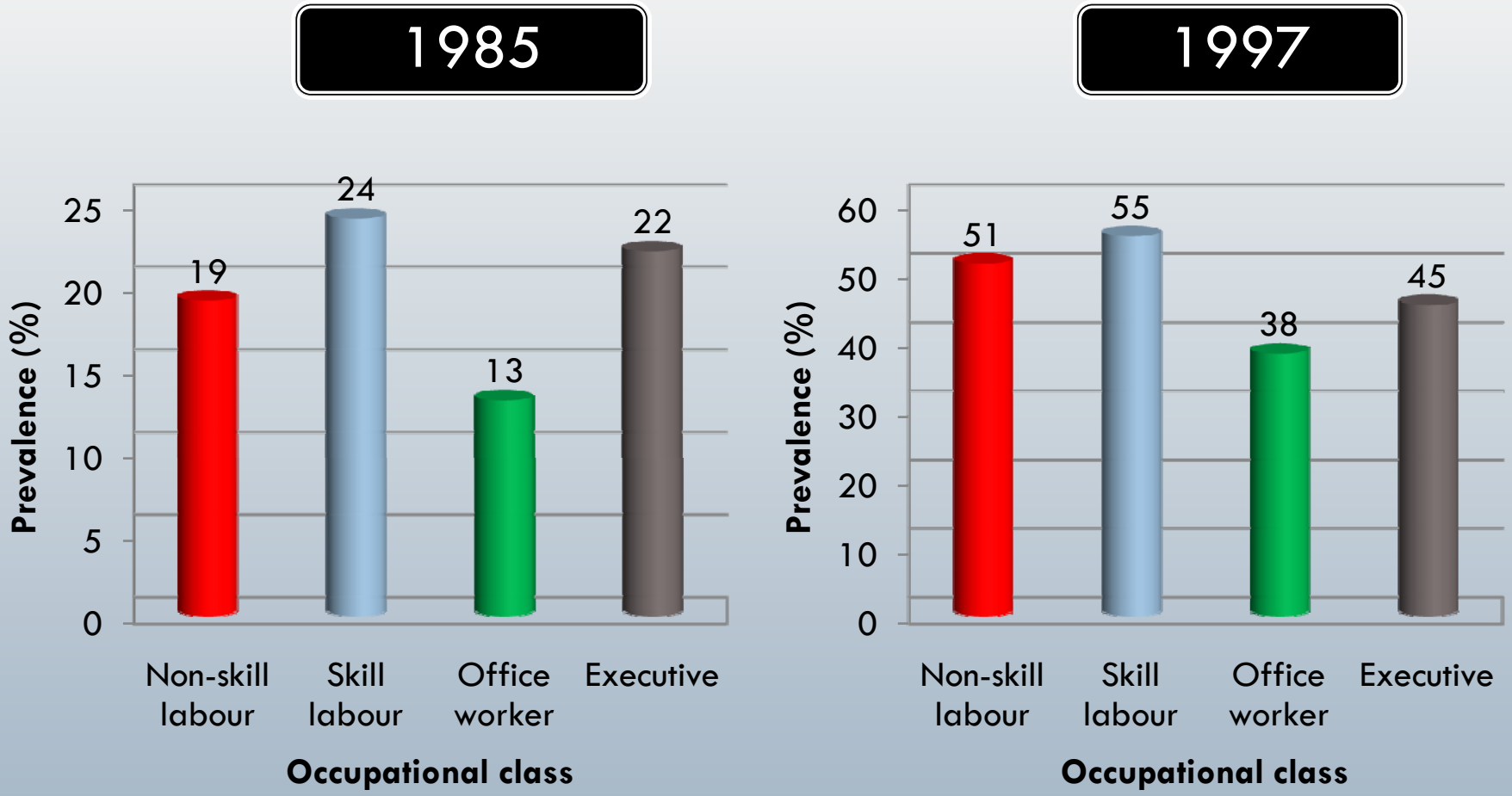


Prevalence of hypertension in 1985 and 1997 according to income level





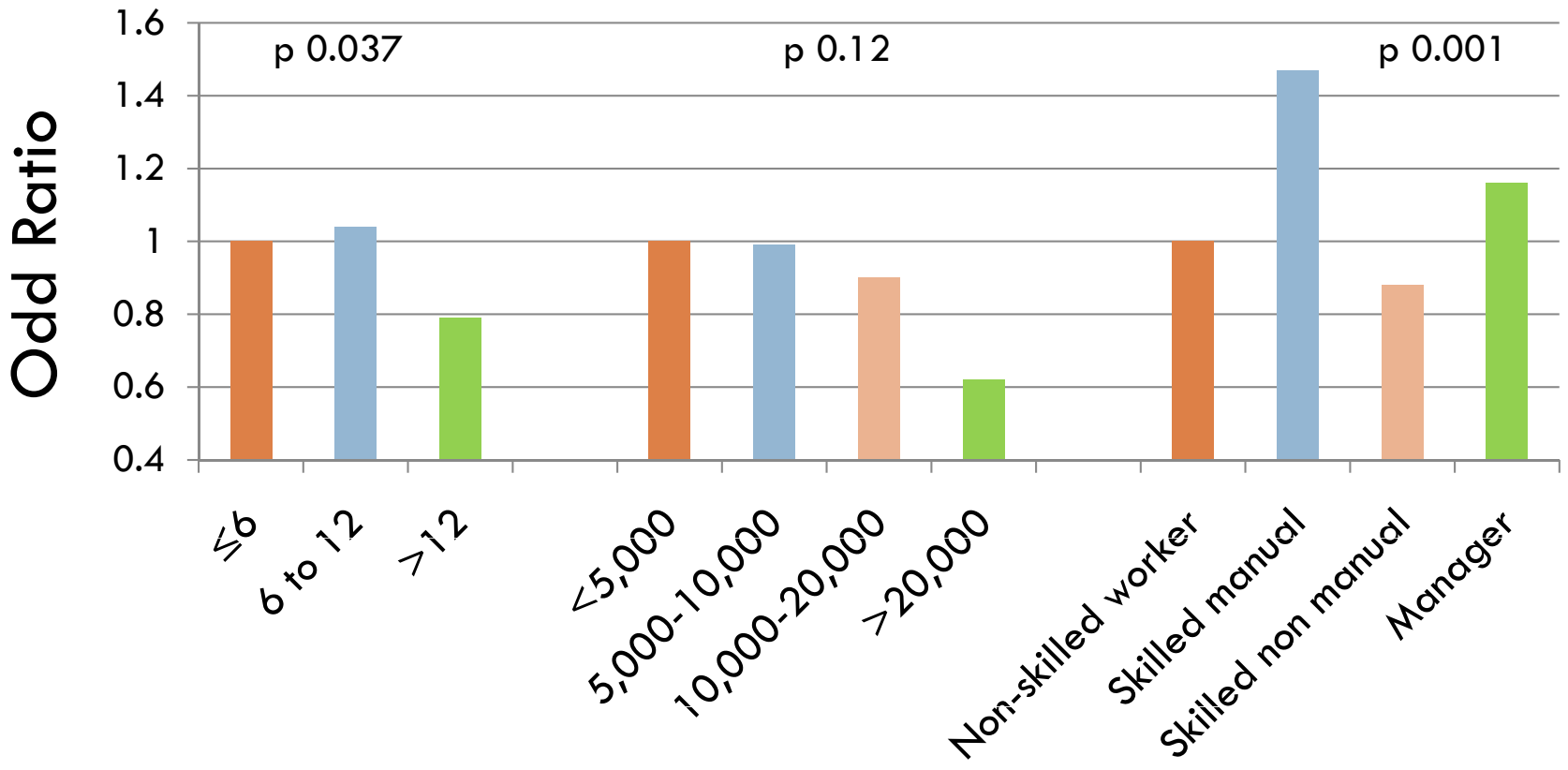
Prevalence of hypertension in 1985 and 1997 according to occupational class



SES & HTN prevalence in 1985:

multivariable analysis

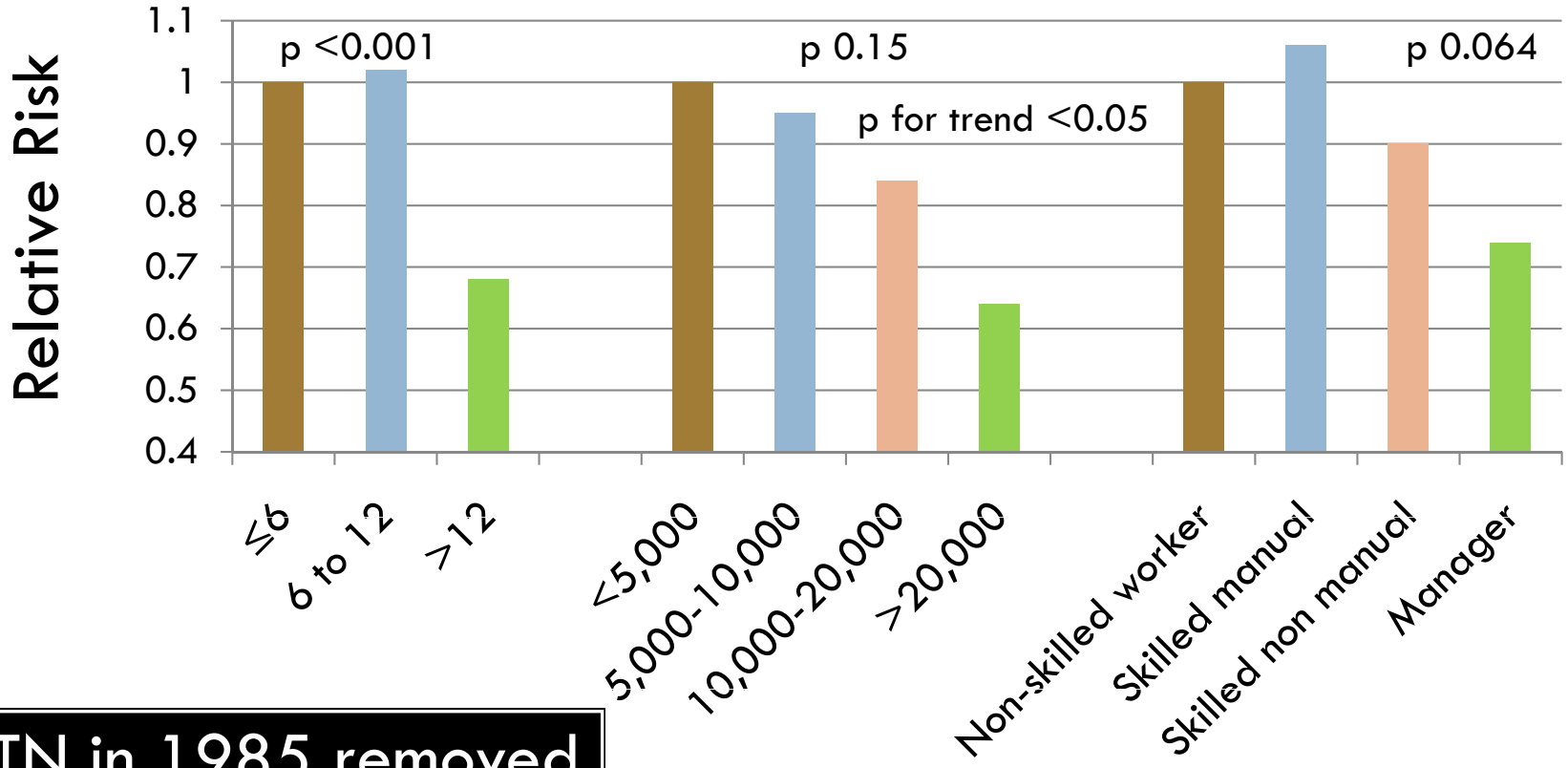
Adjusted for Age, Sex, DM, Smoking, Alcohol, BMI, LDL, HDL, Physical activity



SES & Progression to HTN at 1997

multivariable analysis

Adjusted for Age, Sex, DM, Smoking, Alcohol, BMI, LDL, HDL, Physical activity



HTN in 1985 removed

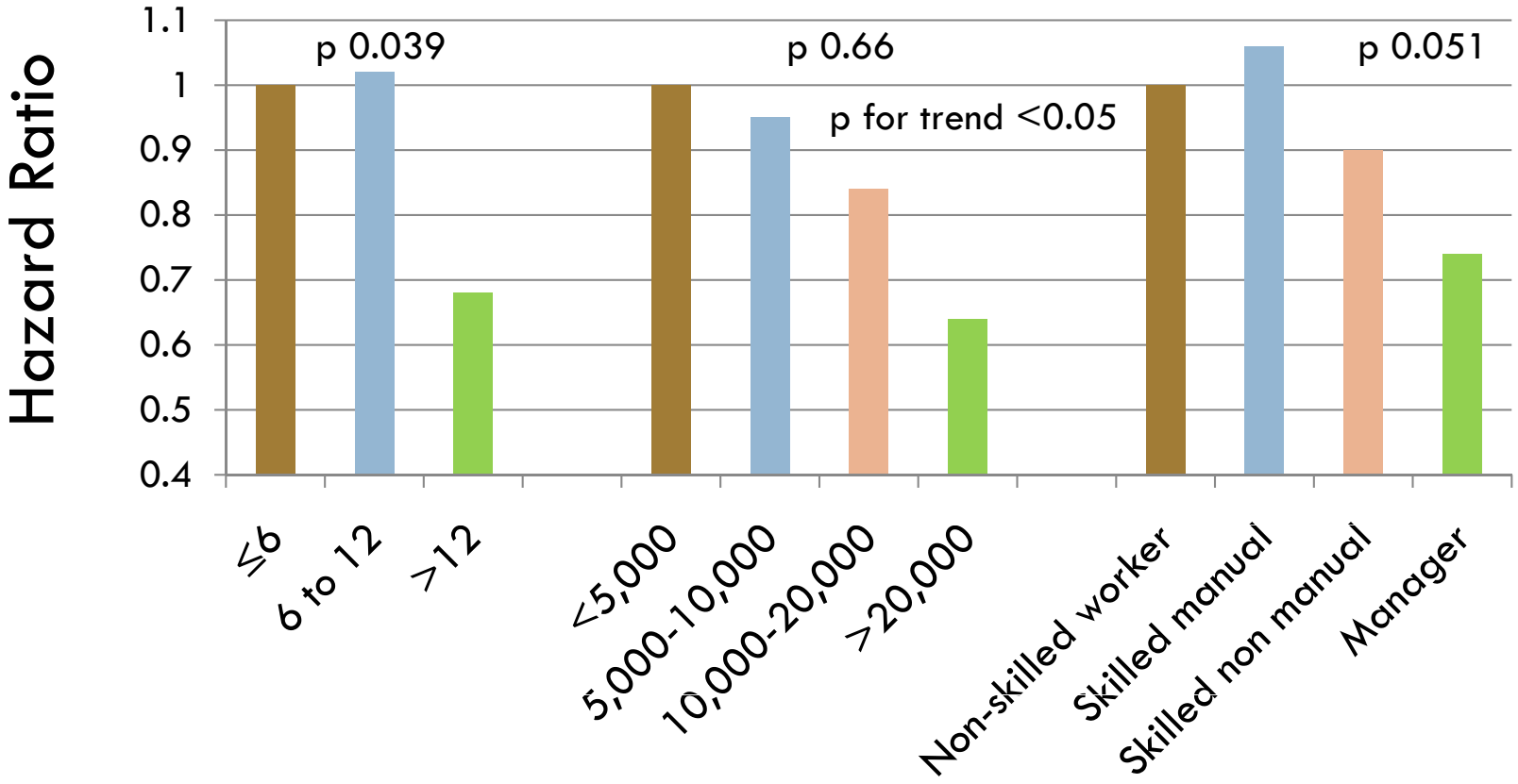
SES & incidence rate of HTN

Predictor		n	no. of events	Incidence rate/1000 person-years
Education	≤6	569	249 (44%)	38.7
	6 to 12	1436	719 (50%)	39.1
	>12	786	362 (46%)	31.8
Income	<5,000	571	261 (46%)	37.5
	5,000-10,000	1077	486 (45%)	35.1
	10,000-20,000	985	507 (51%)	37.9
	>20,000	154	76 (49%)	38.2
Occupation	Non-skilled worker	427	191 (45%)	38.6
	Skilled manual	1092	567 (52%)	41.0
	Skilled non manual	801	367 (46%)	31.8
	Manager	416	202 (49%)	36.1

SES & incidence rate of HTN

multivariable analysis

Adjusted for Age, Sex, DM, Smoking, Alcohol, BMI, LDL, HDL, Physical activity



Conclusion

- Education is an independent predictor for development of hypertension after adjusting for metabolic risk factors
- Income has a trend association with future development of hypertension
- Occupation also shows different risks among classes before adjusting with others HTN risk factors

Acknowledgement

- All Staff of the EGAT study
- Ramathibodi Hospital
- Mahidol University
- Thai Research Fund

Original EGAT Cohort

- Cardiologist
- Neurologist
- Gastroenterologist
- Nephrologist
- Endocrinologist
- Oncologist
- Toxicologist
- Nutritionist
- Dentist
- General practitioner
- Pharmarcist
- Biologist
- Social science

Demographic Characteristic

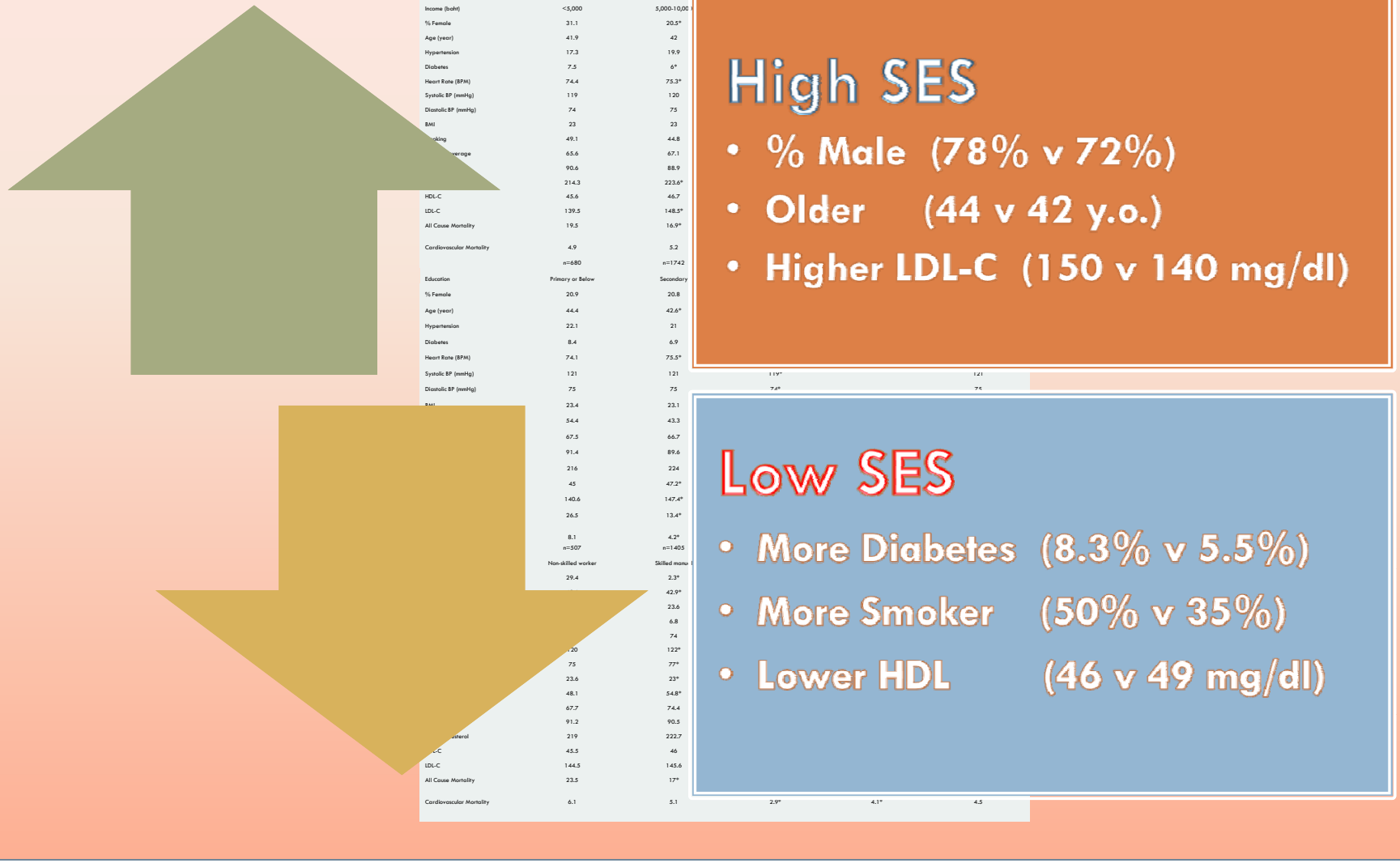


Table 2: Demographic data of each SES indicators

	n=652	n=1275
Income (baht)	<5,000	5,000-10,00
% Female	31.1	20.5*
Age (year)	41.9	42
Hypertension	17.3	19.9
Diabetes	7.5	6*
Heart Rate (BPM)	74.4	75.3*
Systolic BP (mmHg)	119	120
Diastolic BP (mmHg)	74	75
BMI	23	23
[illegible]oking	49.1	44.8
[illegible]verage	65.6	67.1
	90.6	88.9
	214.3	223.6*
HDL-C	45.6	46.7
LDL-C	139.5	148.5*
All Cause Mortality	19.5	16.9*
Cardiovascular Mortality	4.9	5.2
	n=680	n=1742
Education	Primary or Below	Secondary
% Female	20.9	20.8
Age (year)	44.4	42.6*
Hypertension	22.1	21
Diabetes	8.4	6.9
Heart Rate (BPM)	74.1	75.5*
Systolic BP (mmHg)	121	121
Diastolic BP (mmHg)	75	75
BMI	23.4	23.1
	54.4	43.3
	67.5	66.7
	91.4	89.6
	216	224
	45	47.2*
	140.6	147.4*
	26.5	13.4*
	8.1	4.2*
	n=507	n=1405
	Non-skilled worker	Skilled manu
	29.4	2.3*
		42.9*
		23.6
		6.8
		74
	120	122*
	75	77*
	23.6	23*
	48.1	54.8*
	67.7	74.4
	91.2	90.5
[illegible]esterol	219	222.7
[illegible]-C	45.5	46
LDL-C	144.5	145.6
All Cause Mortality	23.5	17*
Cardiovascular Mortality	6.1	5.1
	119*	121
	74*	75
	2.9*	4.1*
		4.5