

Predictors of cardiovascular health screening among healthy Singapore residents

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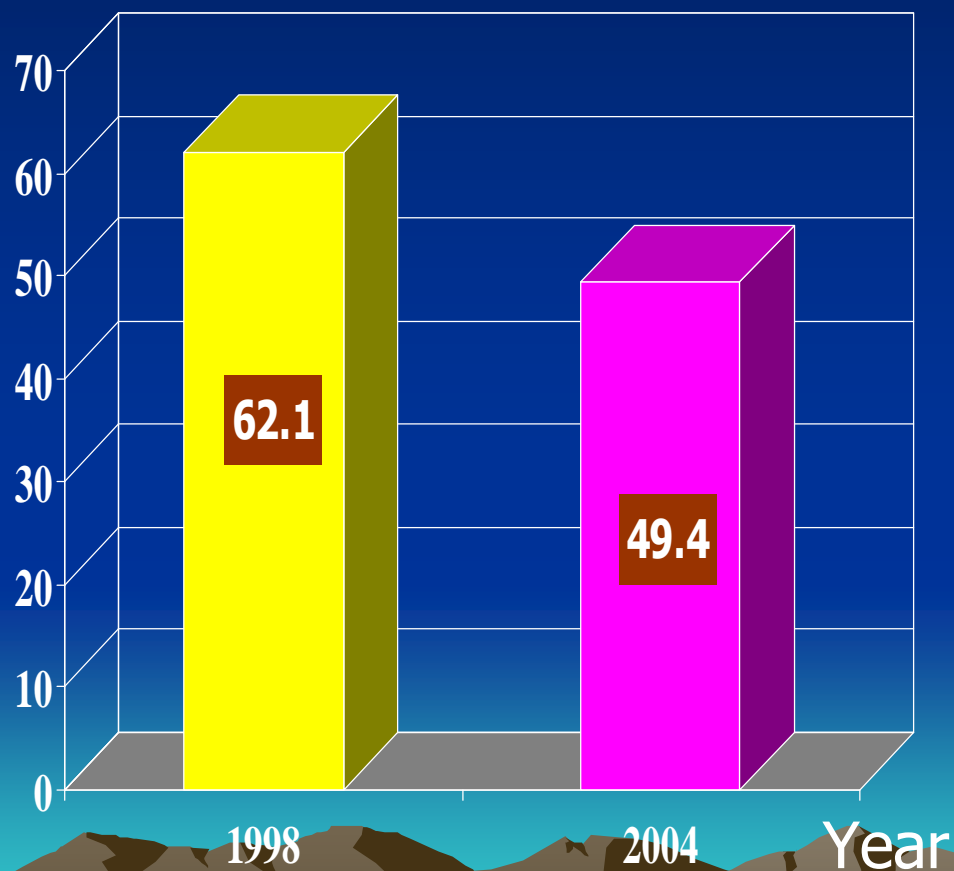
Principal Causes Of Death (Singapore)

		Year	2004	2005	2006
Total Number of Deaths			15,860	16,215	16,393
% of Total Deaths					
1	Cancer		27.1	26.5	28.5
2	Ischaemic Heart Disease		18.8	18.2	18.5
3	Pneumonia		14.1	15.0	13.7
4	Cerebrovascular Disease		9.8	10.0	8.9
5	Accidents, Poisoning & Violence		6.5	6.3	6.3
6	Other Heart Diseases		4.2	4.1	4.3
7	Diabetes Mellitus		3.0	3.1	3.3
8	Chronic Obstructive Lung Disease		3.1	3.5	3.3
9	Urinary Tract Infections		2.3	2.1	2.0
10	Nephritis, Nephrotic Syndrome & Nephrosis		1.6	1.6	1.7

Diabetes mellitus

% of diabetics undiagnosed

Percentage (%)



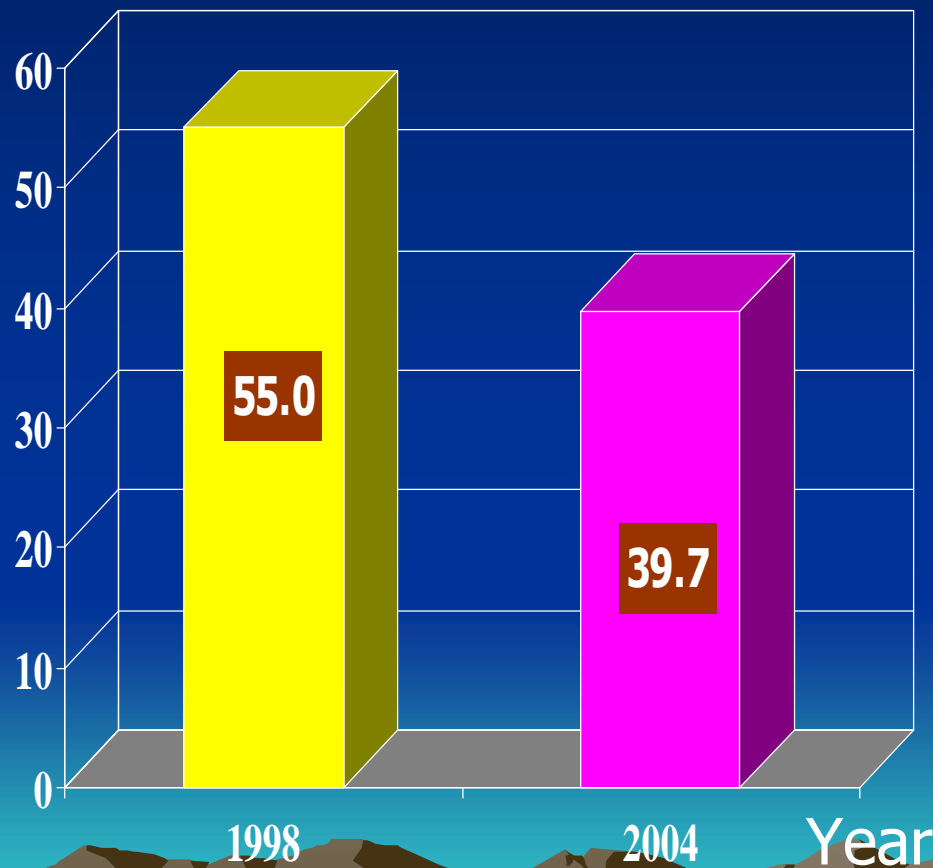
- A high proportion of diabetics were still aware of their condition

Reference: National Health Survey 2004, MOH, Singapore

High Blood Pressure

% of hypertensives undiagnosed

Percentage (%)



- A high proportion of people with high blood pressure were aware of their condition

Reference: National Health Survey 2004, MOH, Singapore

Screening for Cardiovascular Risk Factors in Singapore

- MOH Clinical Practice Guidelines recommends screening for the following cardiovascular risk factors:
- (a) blood pressure measurement at least once every two years for adults aged 21 years and above;
- (b) screening for diabetes from 40 years of age at 3 yearly intervals for persons who do not have risk factors for developing diabetes; and annually for those with diabetes risk factors; and
- (c) a full lipid profile for persons 40 years and above, or earlier if risk factors are present (diabetes mellitus or impaired glucose tolerance test, family history of hyperlipidaemia, smoking, hypertension, family history of premature CHD, and belonging to Indian ethnic group).



Aim

- To study the predictors of cardiovascular health screening among healthy middle-aged Singapore residents
- To identify the segment of the population for more intense health promotion

Methods

- A population-based survey
- Conducted from December 2004 to October 2005
- Focus on screening for hypertension, diabetes mellitus and hypercholesterolemia
- Involves Singapore residents aged 15-69 years
- Households were randomly selected
- Interviews were carried out by trained surveyors using a standard questionnaire



Methods

- The predictors of screening for healthy respondents aged 40-69 years was compared by univariate and forward stepwise logistic regression analyses using SPSSv15
- A probability (p) of <0.05 was considered statistically significant



Result

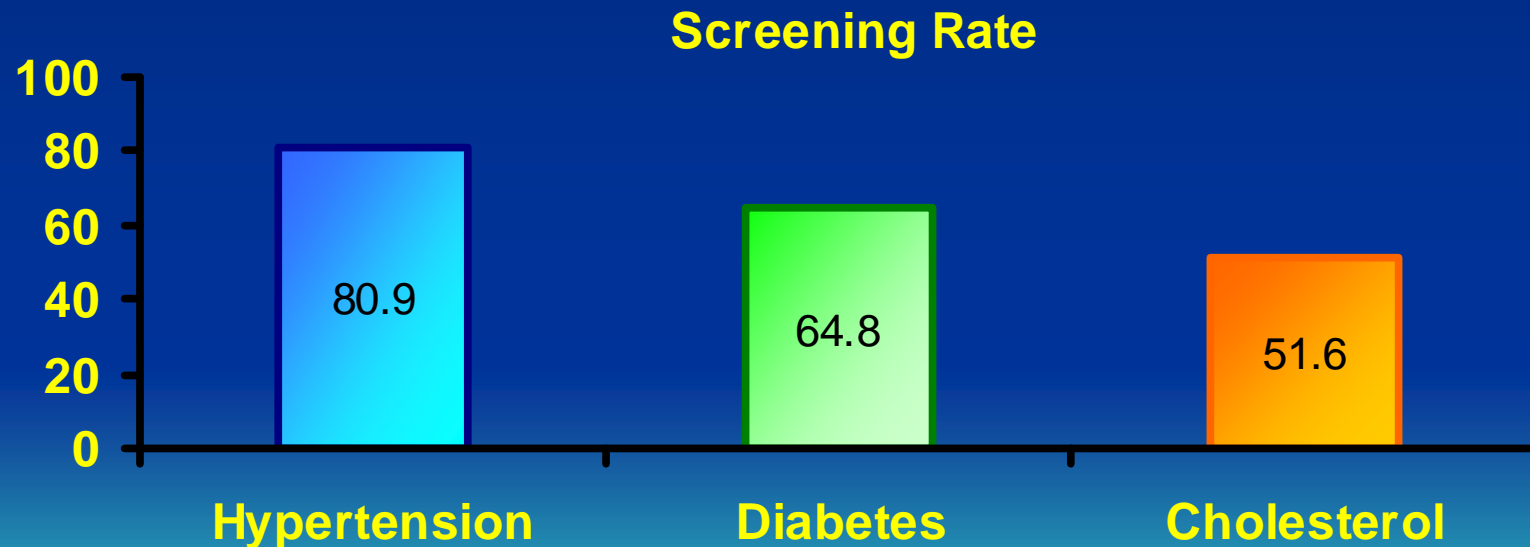
- Overall, there were 2,632 respondents in general population
 - 1461 (62%) were aged 40 – 69 years
 - 940 (64%) among them did not report to have a chronic diseases (i.e. hypertension, diabetes mellitus, hypercholesterolemia, heart disease or stroke)

Respondents aged 40 - 69 years who did not report having a chronic disease

Characteristic		Respondents	
		No.	%
Gender	Male	406	43.2
	Female	534	56.8
Age	40 - 49	551	58.6
	50 - 59	274	29.1
	60 - 69	115	12.2
Ethnicity	Chinese	720	76.6
	Malay	137	14.6
	Indian	66	7.0
	Others	17	1.8
Education	No school / Primary	266	28.3
	Secondary / ITE / Pre-U	500	53.2
	Tertiary	174	18.5
Family History	Hypertension (Yes)	280	29.8
	Diabetes (Yes)	232	24.7
	Heart Disease / Stroke (Yes)	154	16.4
Lifestyle	Smoker (Yes)	146	15.5
	Regular exercise (Yes)	264	28.1
	Regular alcohol intake (Yes)	27	2.9

Result

- Screening rates for hypertension, diabetes mellitus and blood cholesterol among people aged 40 – 69 years who did not report having a chronic condition:



Result

- Factors associated with screening for hypertension
 - family history of hypertension
 - higher educational levels

Characteristic		Screening for Hypertension		
		No.	%	P-value
Gender	Male	324	79.8	ns
	Female	436	81.6	
Age	40 - 49	436	79.1	ns
	50 - 59	226	82.5	
	60 - 69	98	85.2	
Ethnicity	Chinese	584	81.1	ns
	Malay	106	77.4	
	Indian	56	84.8	
	Others	14	82.4	
Education	No school / Primary	204	76.7	<0.01
	Secondary / ITE / Pre-U	401	80.2	
	Tertiary	155	89.1	
Family History	Hypertension (Yes)	238	85.0	0.037
	Diabetes (Yes)	198	85.3	
	Heart Disease / Stroke (Yes)	130	84.4	
Lifestyle	Smoker (Yes)	111	76.0	ns
	Regular exercise (Yes)	224	84.8	
	Regular alcohol intake (Yes)	20	74.1	

Result

- Factor independently associated with screening for hypertension
 - higher educational levels

Characteristic		Screening for Hypertension	
		Adj OR	95% CI
Education	No school / Primary	1	
	Secondary / ITE / Pre-U	1.23	(0.86 - 1.76)
	Tertiary	2.48	(1.42 - 4.31)

Result

- Factors associated with screening for diabetes
 - age, ethnicity
 - family history of cardiovascular risk factors
 - higher educational levels
 - regular exercise

Characteristic		Screening for Diabetes		
		No.	%	P-value
Gender	Male	267	65.8	ns
	Female	342	64.0	
Age	40 - 49	339	61.5	0.045
	50 - 59	190	69.3	
	60 - 69	80	69.6	
Ethnicity	Chinese	461	64.0	0.01
	Malay	88	64.2	
	Indian	53	80.3	
	Others	7	41.2	
Education	No school / Primary	151	56.8	<0.001
	Secondary / ITE / Pre-U	325	65.0	
	Tertiary	133	76.4	
Family History	Hypertension (Yes)	206	73.6	<0.001
	Diabetes (Yes)	186	80.2	
	Heart Disease / Stroke (Yes)	120	77.9	
Lifestyle	Smoker (Yes)	86	58.9	ns
	Regular exercise (Yes)	197	74.6	
	Regular alcohol intake (Yes)	18	66.7	

Result

- Factors independently associated with screening for diabetes
 - age,
 - family history of cardiovascular risk factors
 - higher educational levels
 - regular exercise

	Characteristic	Screening for Diabetes Adj OR	95% CI
Age	40 - 49	1	
	50 - 59	1.63	(1.17 - 2.25)
	60 - 69	2.11	(1.31 - 3.39)
Education	No school / Primary	1	
	Secondary / ITE / Pre-U	1.46	(1.05 - 2.04)
	Tertiary	2.67	(1.68 - 4.25)
Family History	Diabetes (No)	1	
	Diabetes (Yes)	2.66	(1.84 - 3.83)
Lifestyle	Regular exercise (No)	1	
	Regular exercise (Yes)	1.62	(1.17 - 2.26)

Result

- Factors associated with screening for blood cholesterol
 - family history of hypertension or diabetes
 - higher educational levels
 - non-smokers
 - regular exercise

	Characteristic	Screening for Cholesterol		
		No.	%	P-value
Gender	Male	203	50.0	ns
	Female	282	52.8	
Age	40 - 49	271	49.2	ns
	50 - 59	155	56.6	
	60 - 69	59	51.3	
Ethnicity	Chinese	375	52.1	ns
	Malay	61	44.5	
	Indian	40	60.6	
	Others	9	52.9	
Education	No school / Primary	118	44.4	<0.001
	Secondary / ITE / Pre-U	253	50.6	
	Tertiary	114	65.5	
Family History	Hypertension (Yes)	162	57.9	0.013
	Diabetes (Yes)	136	58.6	0.015
	Heart Disease / Stroke (Yes)	90	58.4	ns
Lifestyle	Smoker (Yes)	63	43.2	0.03
	Regular exercise (Yes)	165	62.5	<0.001
	Regular alcohol intake (Yes)	13	48.1	ns

Result

- Factors independently associated with screening for blood cholesterol
 - higher educational levels
 - non-smokers
 - regular exercise

	Characteristic	Screening for Cholesterol Adj OR	95% CI
Education	No school / Primary	1	
	Secondary / ITE / Pre-U	1.26	(0.94 - 1.71)
	Tertiary	2.11	(1.47 - 3.27)
Lifestyle	Smoker (Yes)	1	
	Smoker (No)	1.45	(1.01 - 2.08)
	Regular exercise (No)	1	
	Regular exercise (Yes)	1.76	(1.31 - 2.37)

Conclusion

- The screening rates for diabetes mellitus and blood cholesterol amongst middle-aged Singapore residents were relatively low.
- People with tertiary education were more likely to undergo health screening compared to those with less than secondary education.
- People who adopt a healthier lifestyle were also more likely to undergo screening for diabetes or high cholesterol.



Population screening for CVD

