

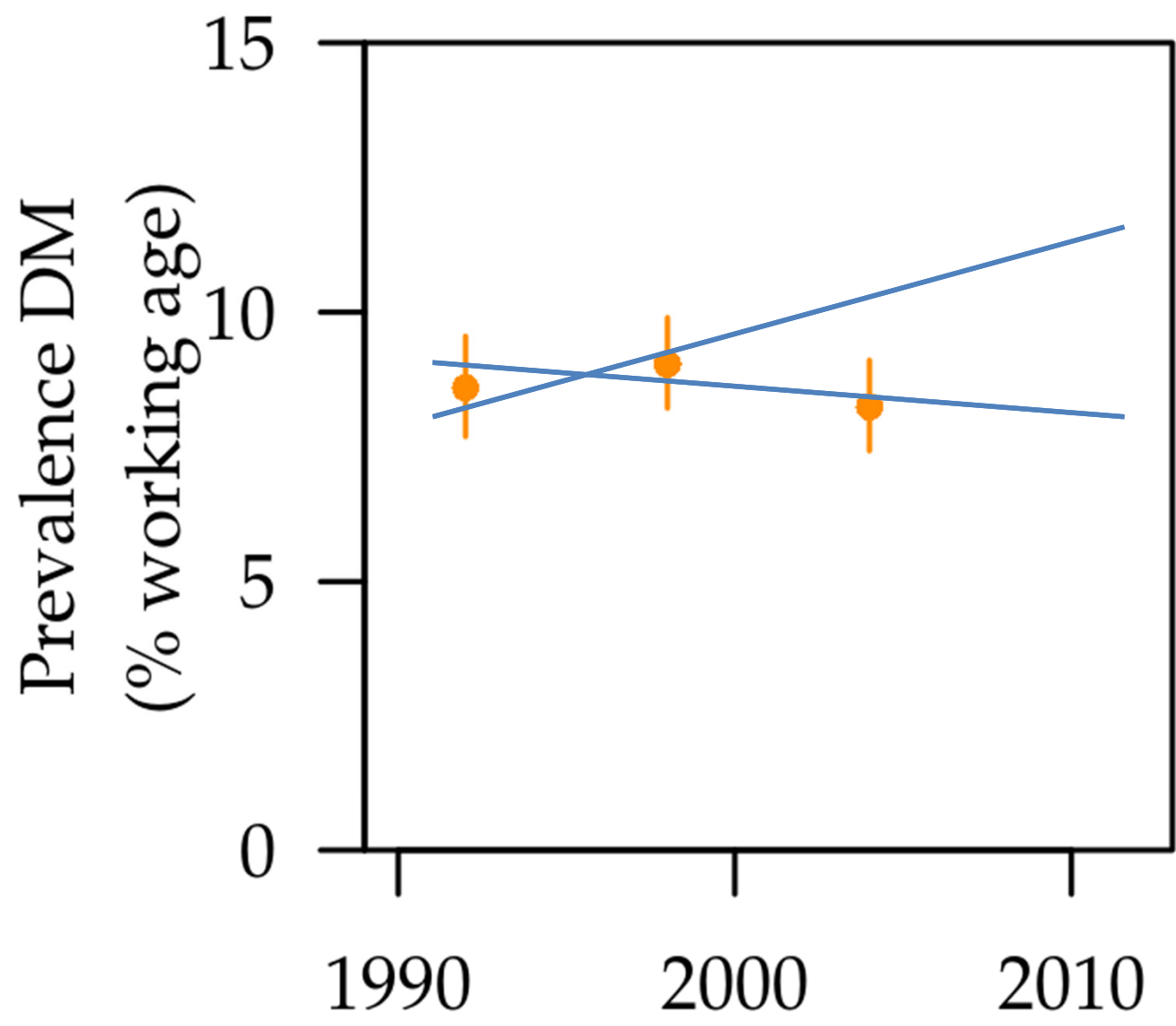
# The use of evidence synthesis and modelling to help develop policy: the Singapore case

Alex R Cook,  
Saw Swee Hock School of Public Health,  
National University of Singapore;  
and Yale-NUS College

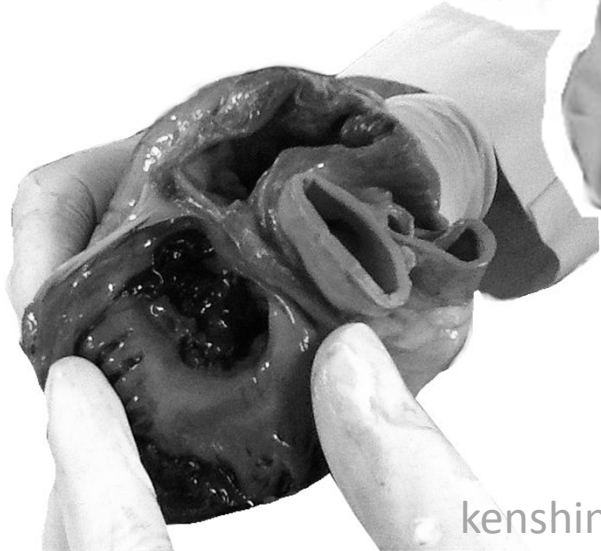


Saw Swee Hock  
School of Public Health





More:




kenshinb








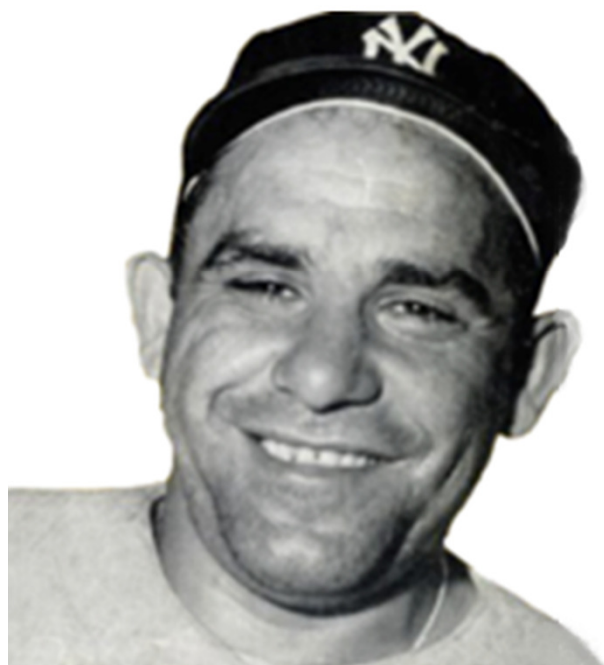
jacklee

## Singapore Weather Forecast

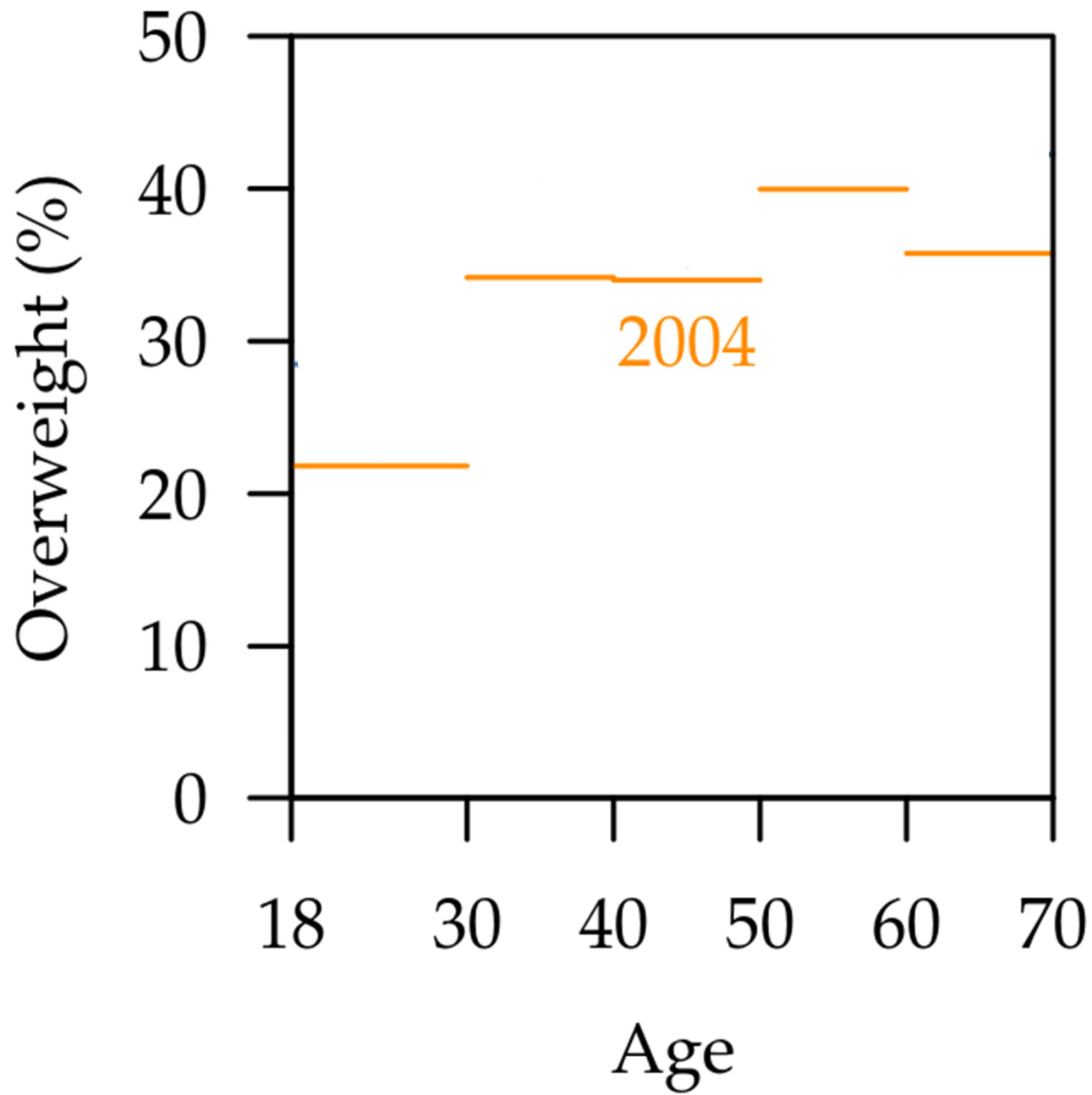
7-Day Weather Forecast for **Singapore**

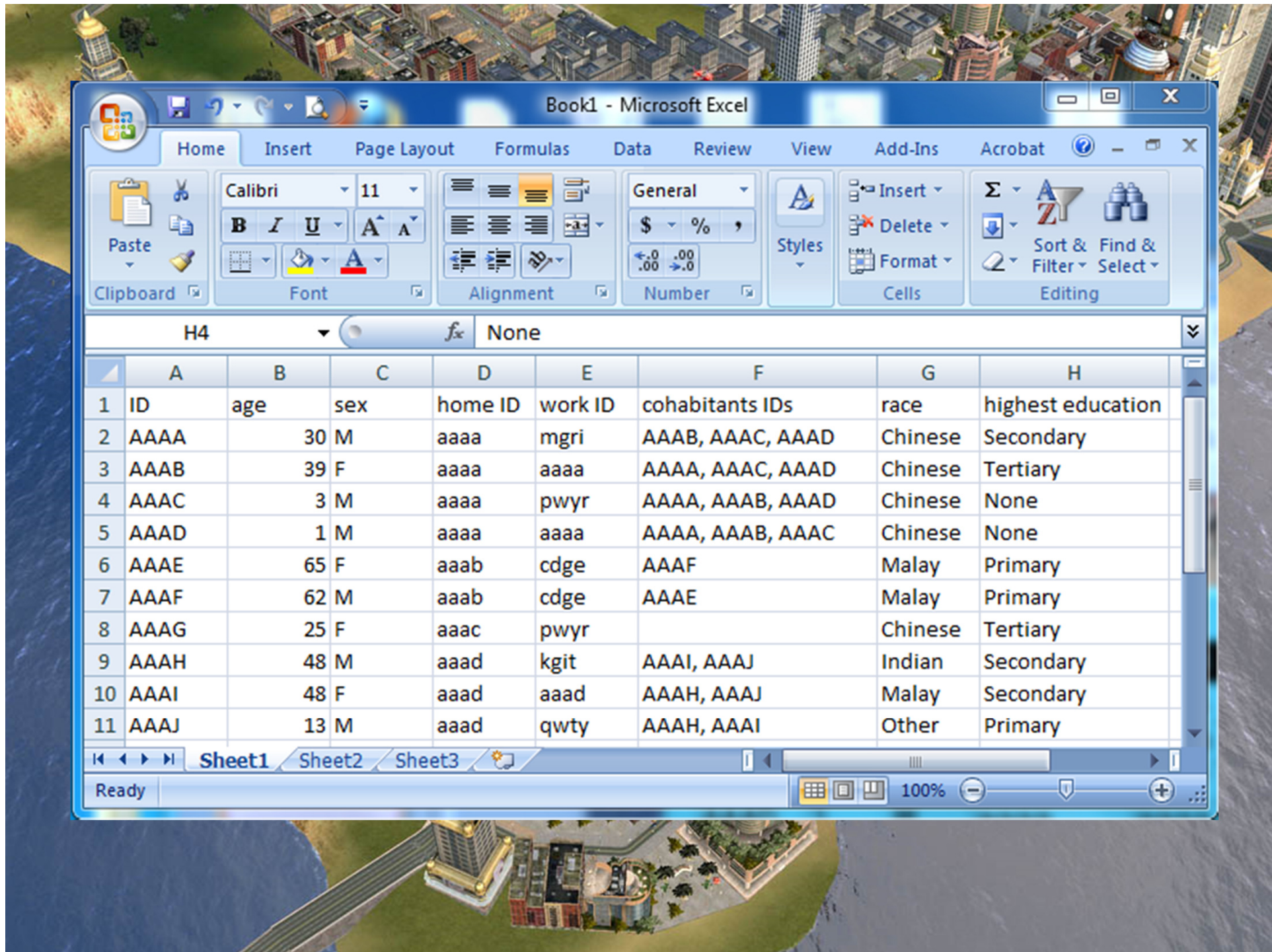
 [View Calendar](#)

<u>Monday, 1</u>	Tuesday, 2	Wednesday, 3	Thursday, 4	Friday, 5
 32   27 °C	 32   27 °C	 32   27 °C	 32   27 °C	 32   27 °C
Chance of T-storms	Chance of T-storms	Chance of T-storms	Chance of T-storms	Chance of T-storms
50% Chance of Precipitation	50% Chance of Precipitation	50% Chance of Precipitation	50% Chance of Precipitation	50% Chance of Precipitation



Prediction is very hard, especially about the future.

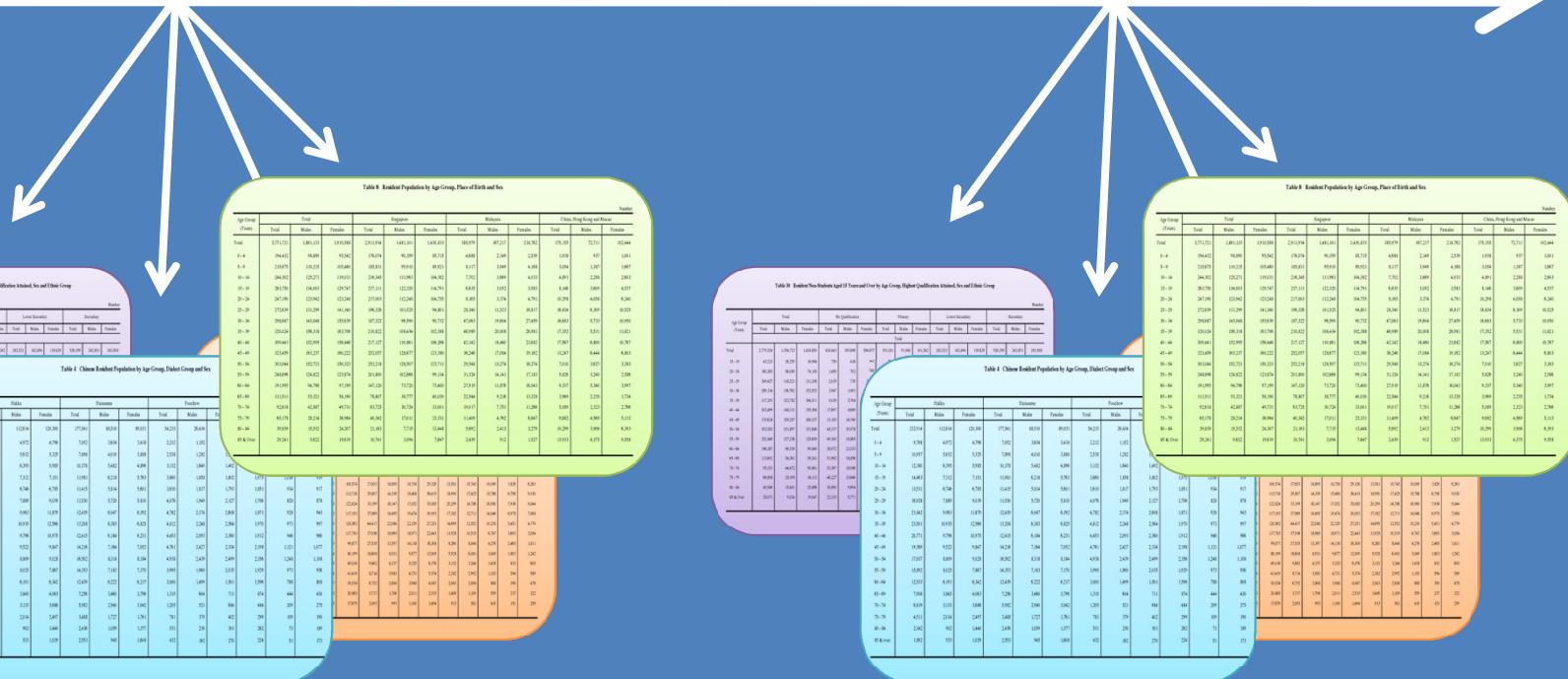




# DEMOS: Demographic Epidemiological Model of Singapore

# Model cum Database

## Simulation stream



# Demographic

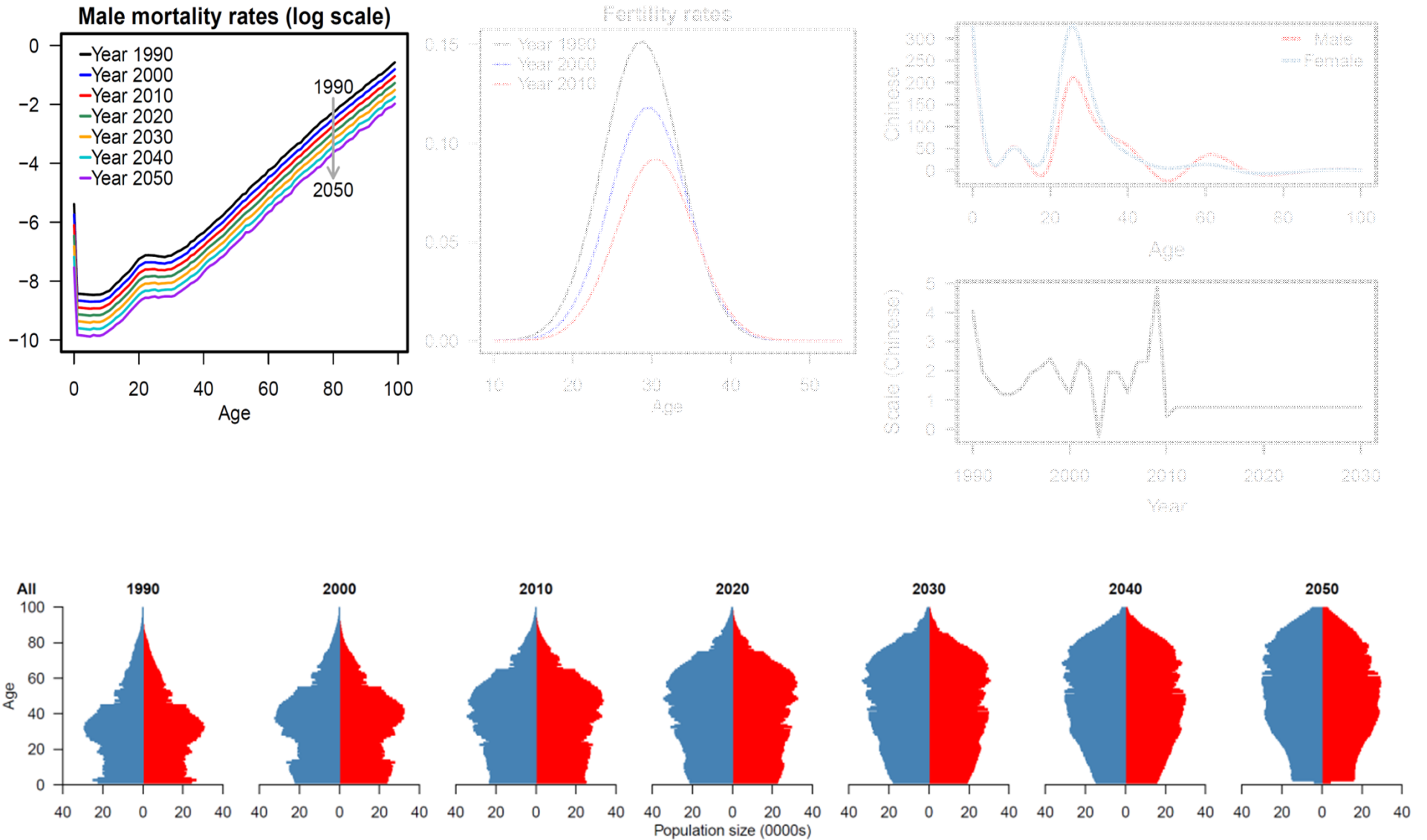
sex  
race  
age  
YoB



lifespan  
births  
migration

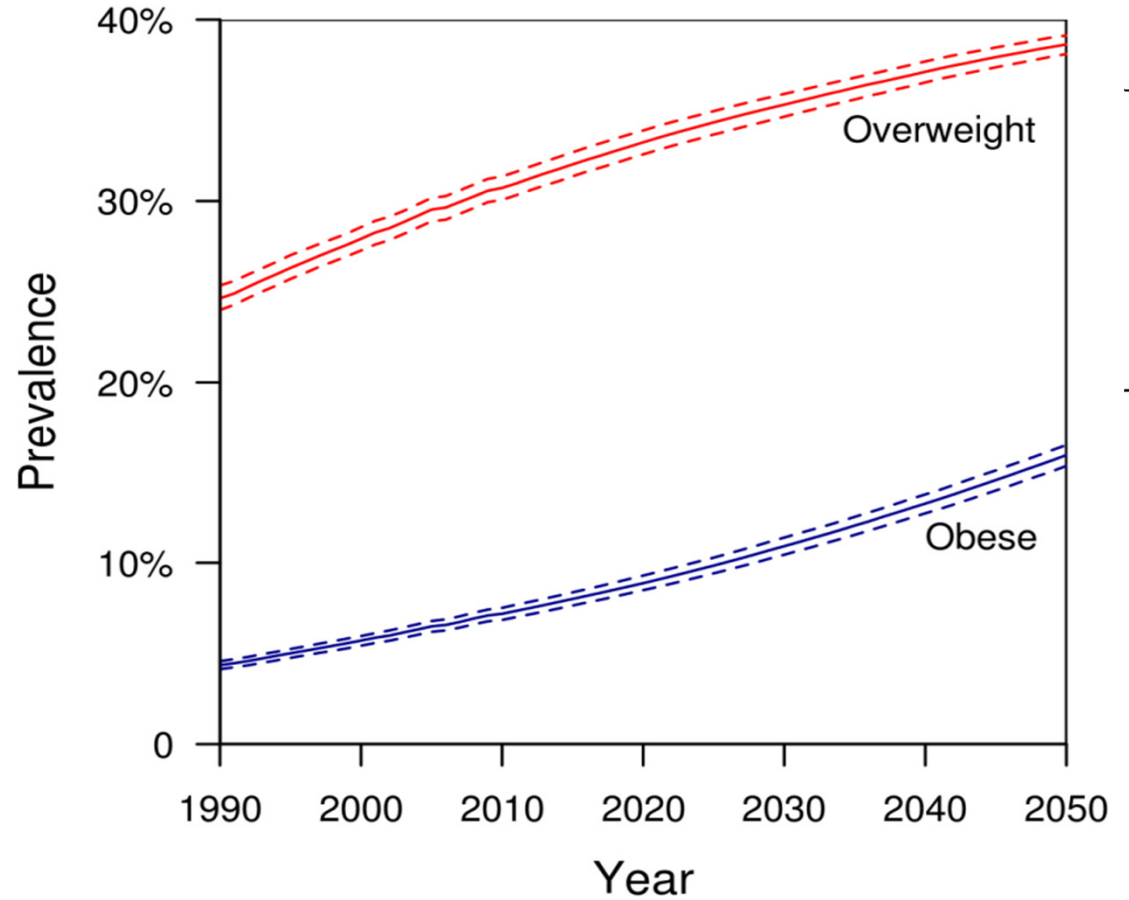
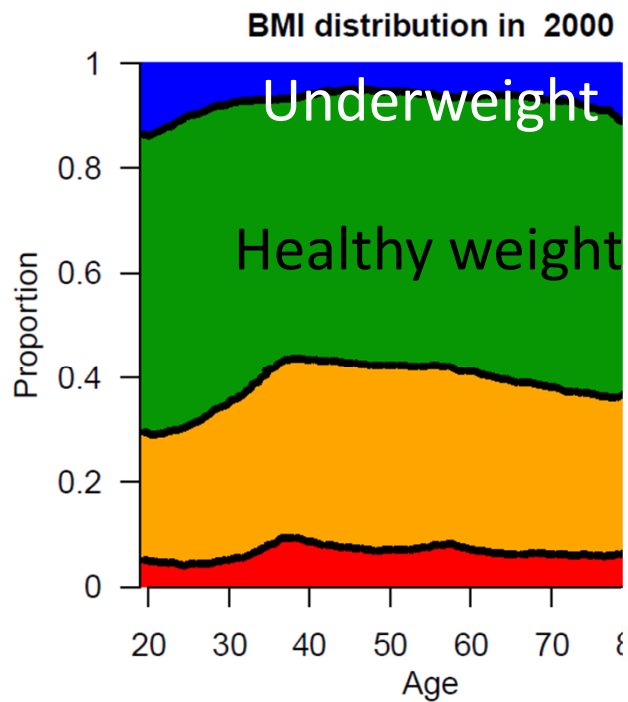
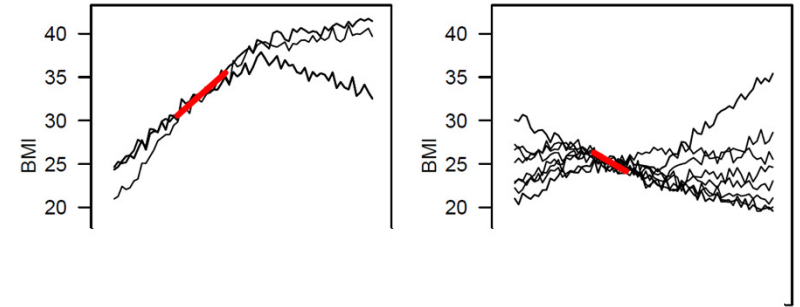


# The demographic model



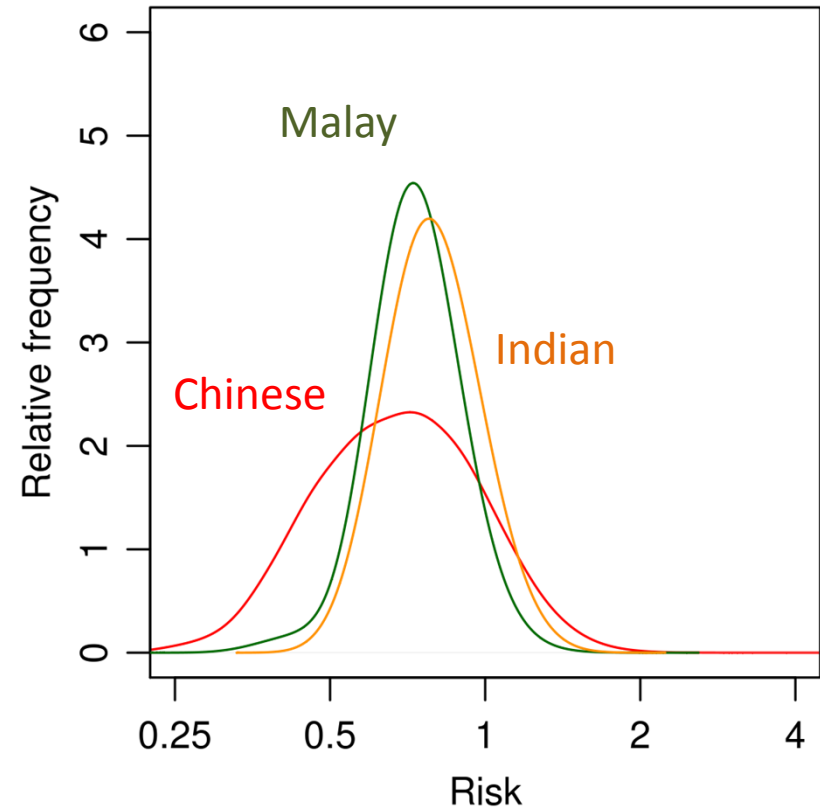
# The BMI model

1992      1998      2005



# The genetic model

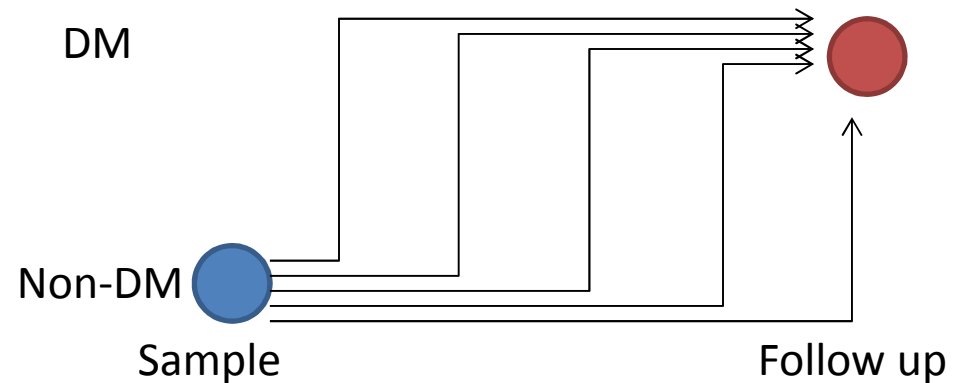
- Greater risk of DM among Malay and Indians
- Also substantial variability within ethnic groups
- Derived joint distribution of 14 risk alleles within our population
- Converted this to 'individual risk' distribution



# The diabetes model

- Annual risk of developing (cryptic) DM, depends on:

- age
- race, sex
- genetic risk
- BMI that year

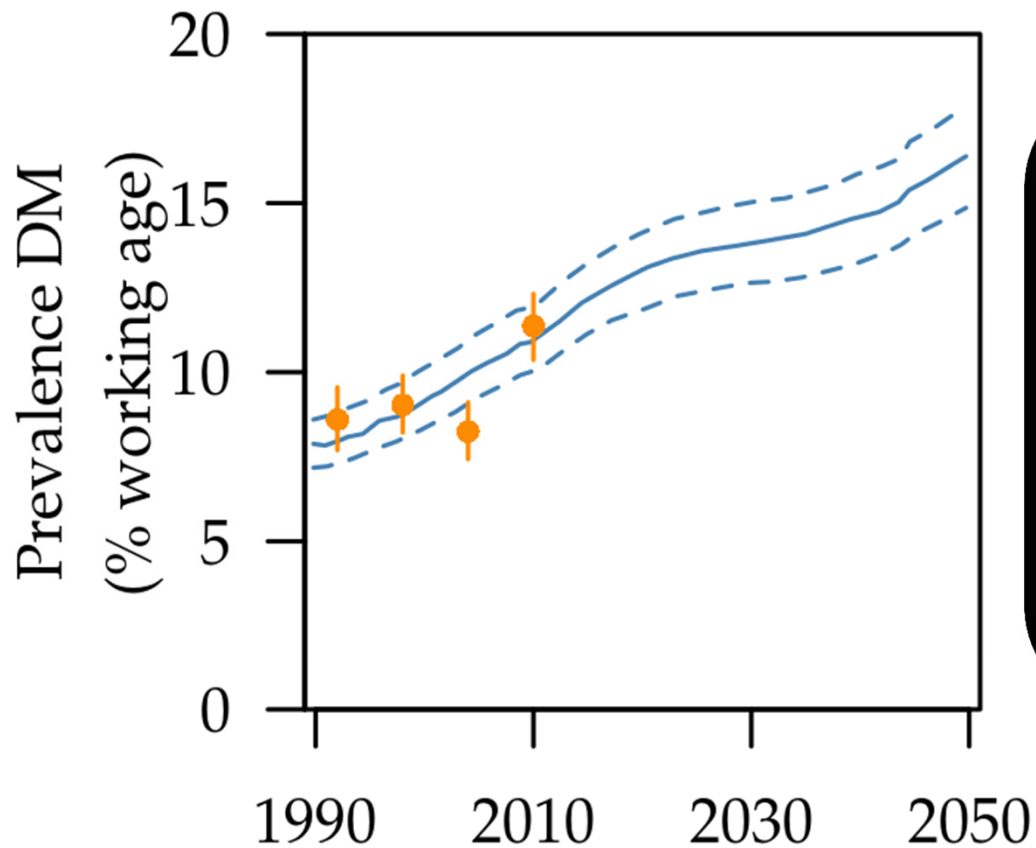


- Estimated from longitudinal data
- Interim BMI imputed using fitted BMI model
- *Corrected* DM status accounts for differing tests

# Forecast incidence

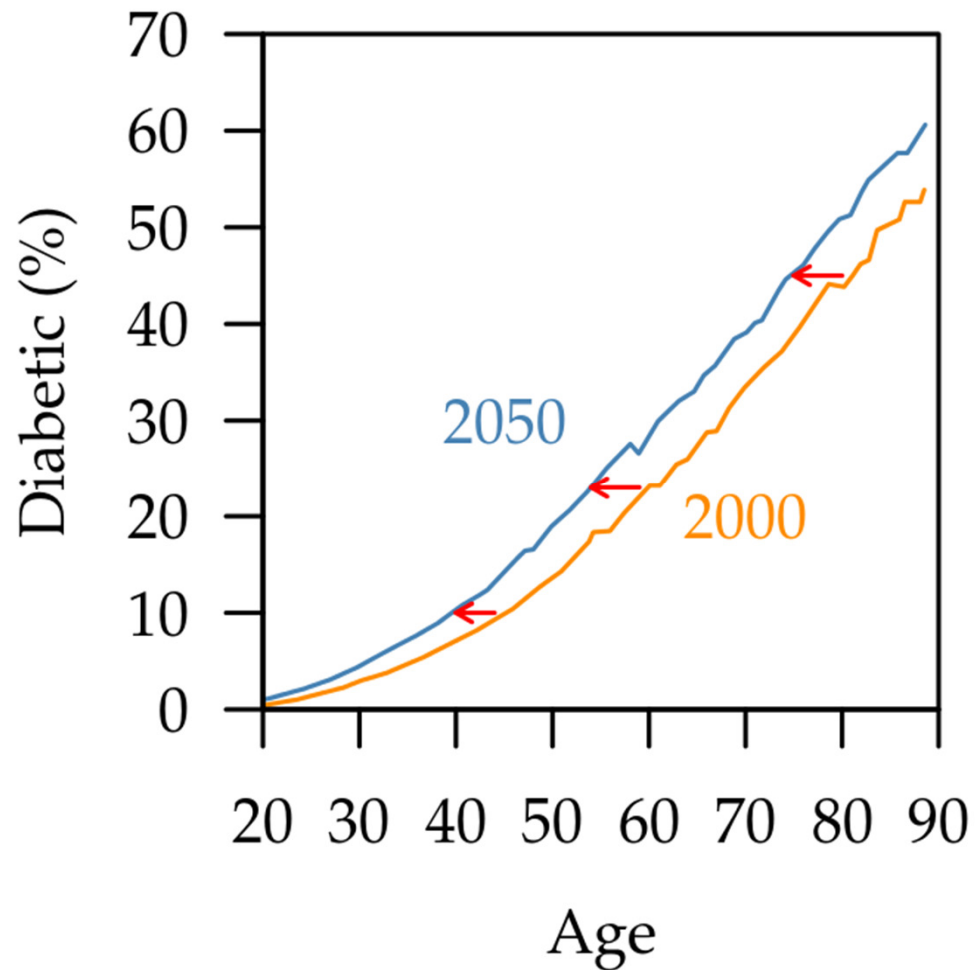
	Chinese		Indian		Malay		Total	
Period	F	M	F	M	F	M	F	M
1990–2000	5	6	8	10	7	7	5	6
2000–2010	5	7	11	13	8	8	6	8
2010–2020	6	8	11	13	10	11	7	9
2020–2030	7	9	14	15	12	13	8	10
2030–2040	8	11	16	17	13	15	9	12
2040–2050	9	12	17	19	14	17	10	13

# Forecasts



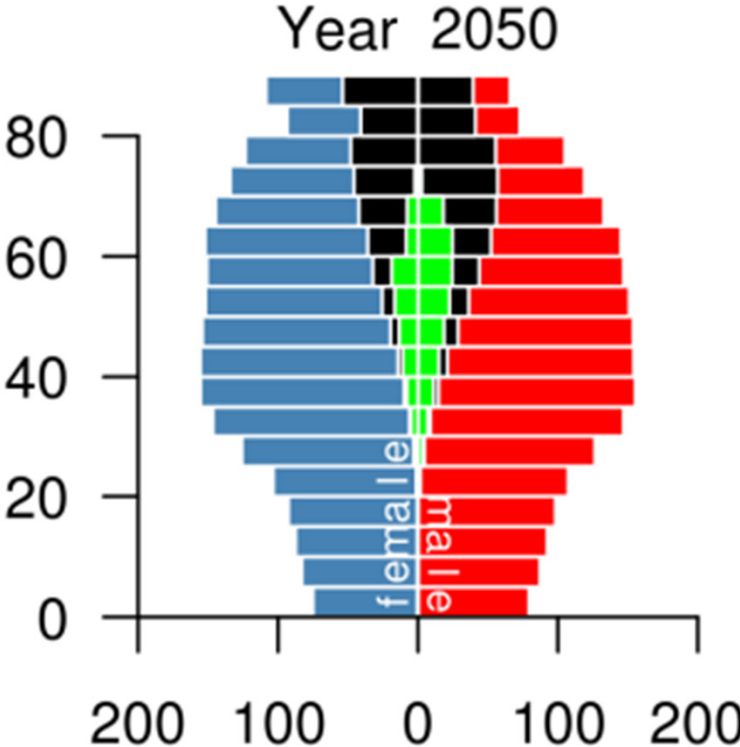
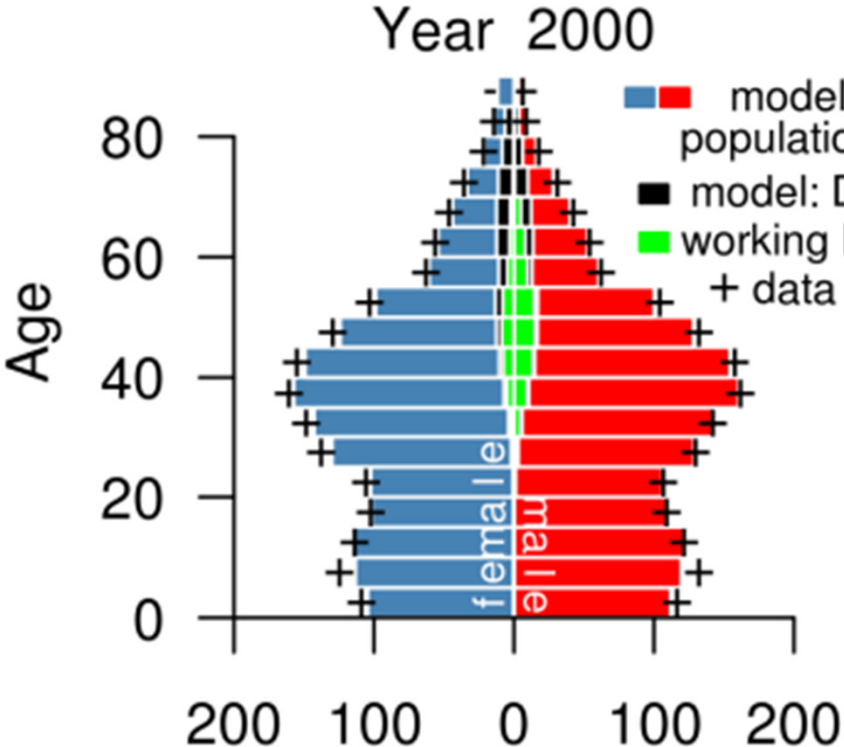
By 2050, about 15% of working age adults (18–65) are expected to have DM

# Forecasts



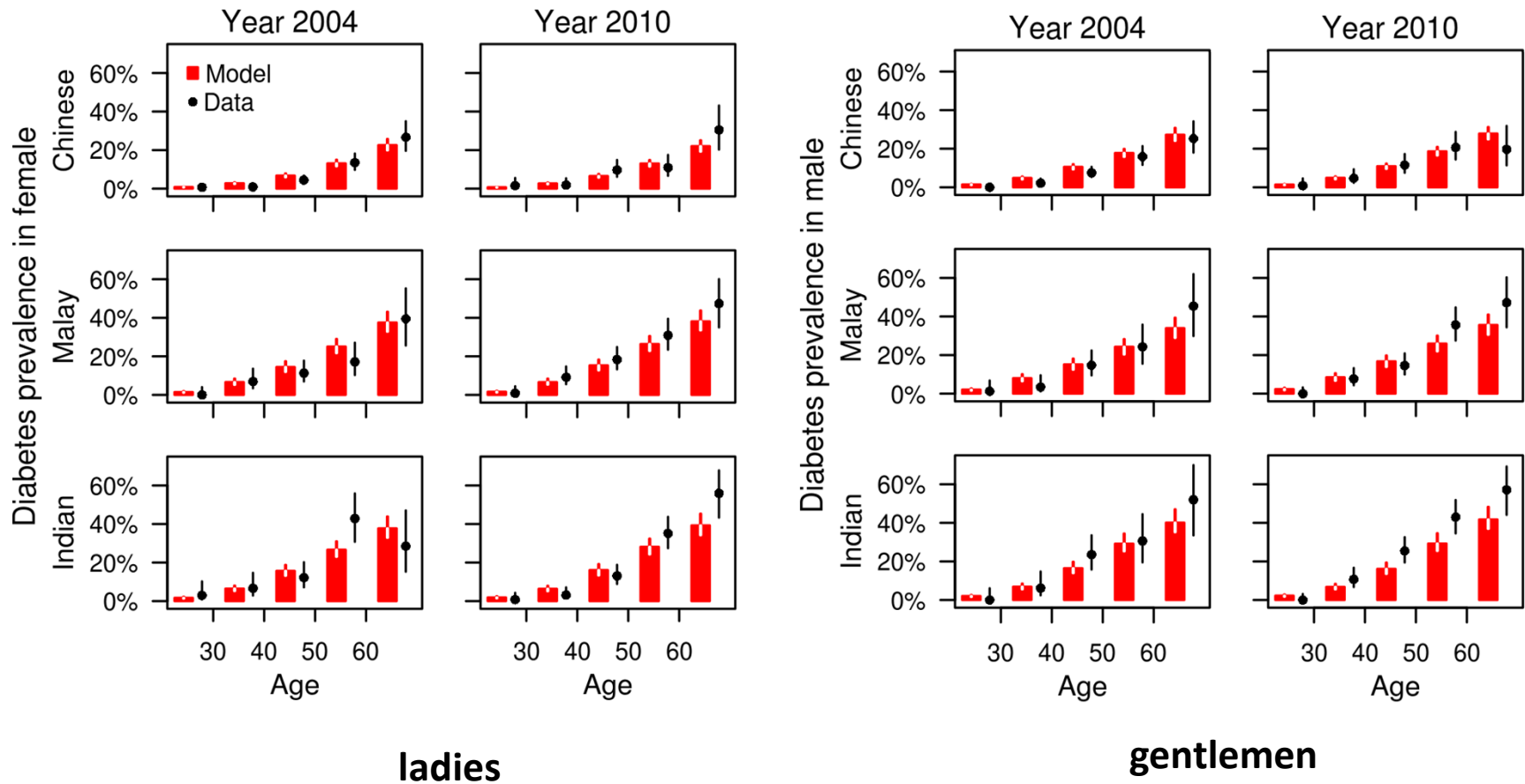
One in two living to 75 will get DM in their lifetime

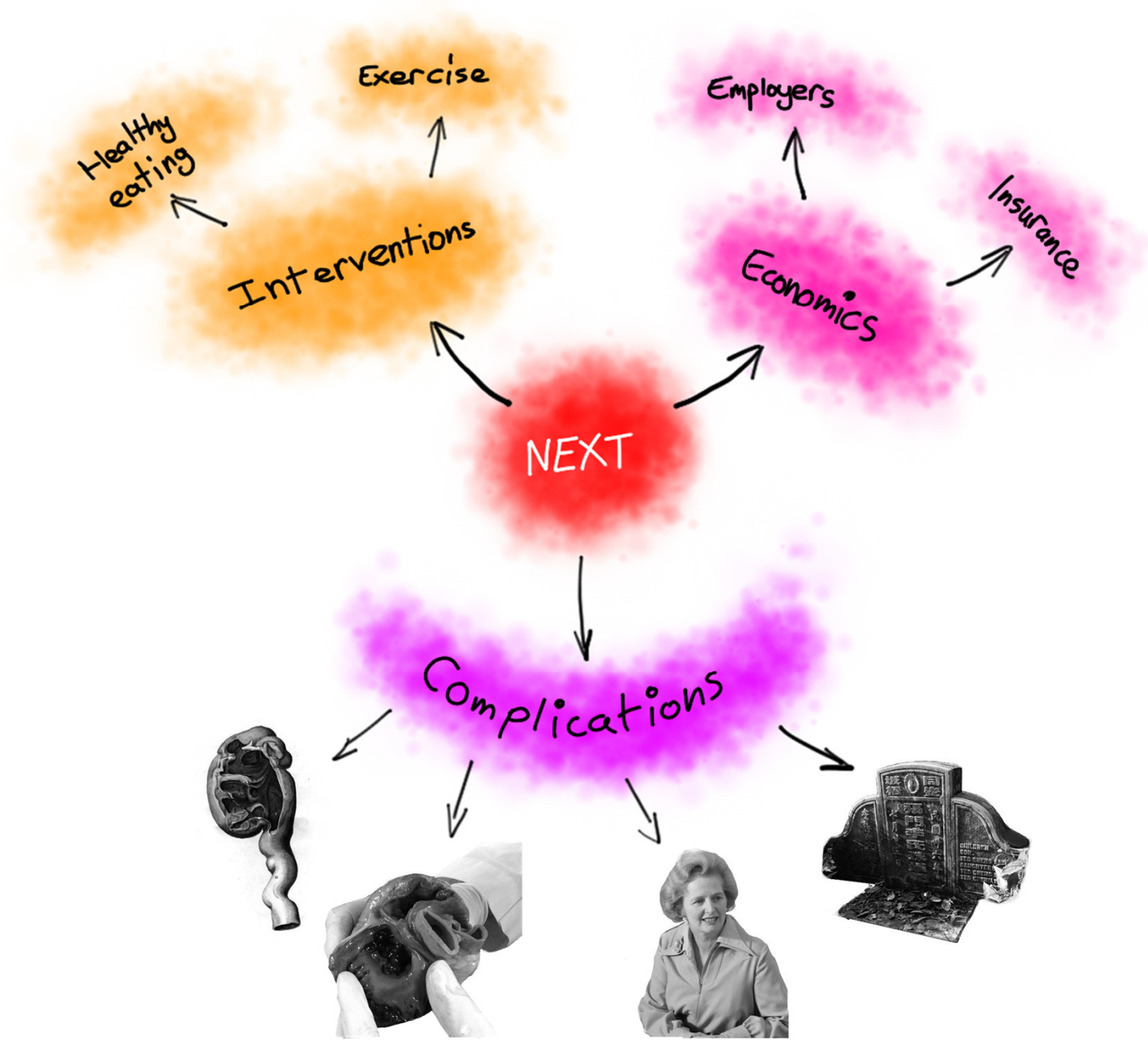
# Forecasts





# Internal validation





## Take home messages

Modelling makes lots of things possible:  
but is no substitute for good data

Individual level data far stronger than  
aggregated data

Modelling is an interdisciplinary endeavor

**Team:**

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Leontine Alkema, Lim Wei Yen, Rob van Dam, Teo Yik Ying,  
Chia Kee Seng



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