Community Awareness, Promotion and Prevention
Part 1

Postgraduate Diabetes Management and Education

Module 7102

Semester 1

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Learning Outcomes

- At the end of the lecture, the students should be able to:

Community Awareness

- Discuss the general public's knowledge of and attitude towards diabetes
- Discuss community resources available for people with diabetes /family members
- Interpret country-specific surveillance data on the prevalence of diabetes and risk factors for the development of diabetes in the community

Learning Outcomes

- At the end of the lecture, the students should be able to:
- **Promotion**
- Discuss health priorities and resources needed for diabetes in the country
- Discuss the value of screening programmes and school and workplace awareness programmes
- Discuss levels of health promotion in individuals communities, organization and public policy and practice
- Discuss approaches to health promotion, the use and applicability of various intervention activities in relation to promoting diabetes health
- Discuss the role of advocacy and communication skills in influencing policy making

Learning Outcomes

- At the end of the lecture, the students should be able to:

Prevention

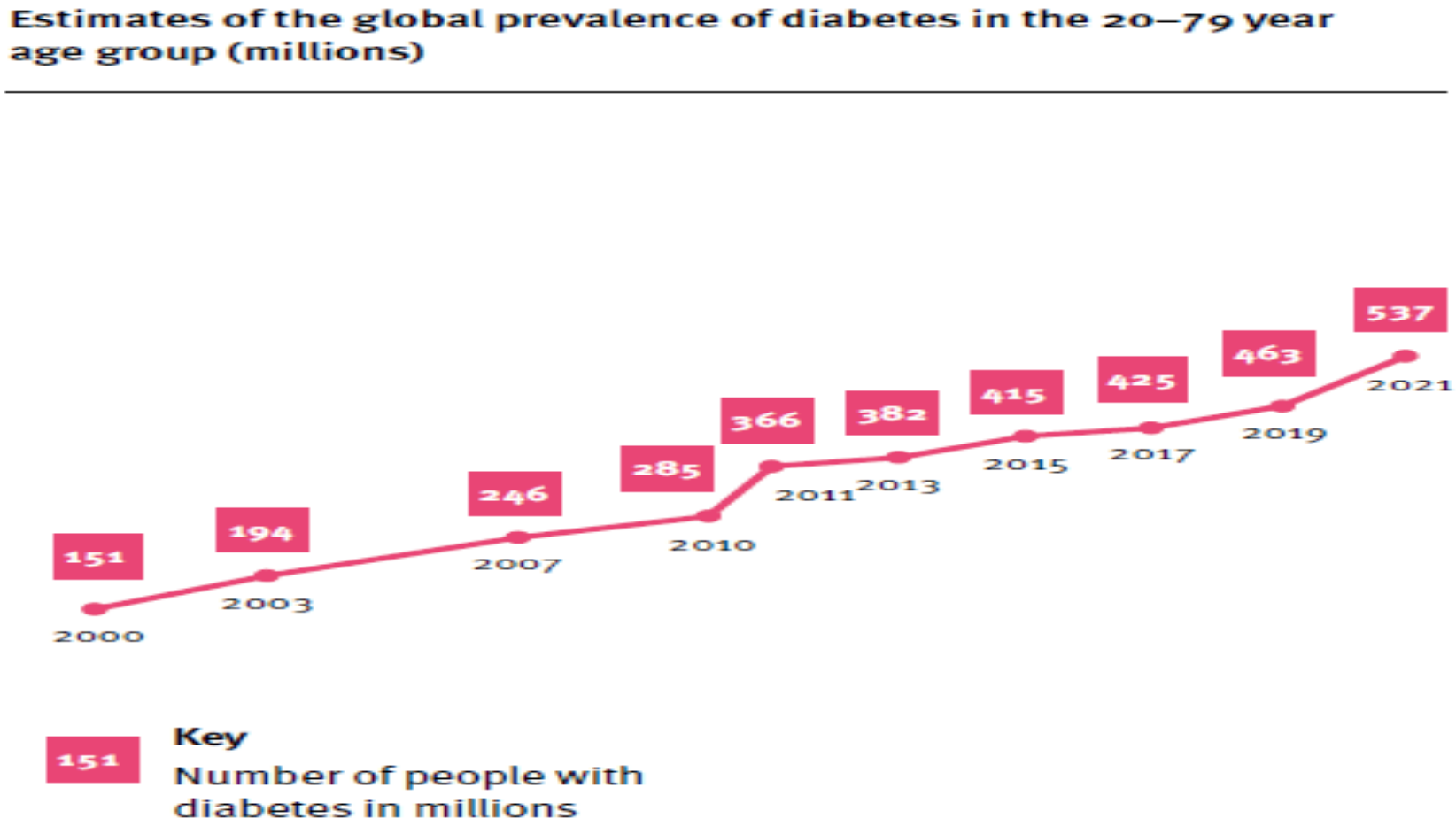
- Discuss the use epidemiological data to justify preventive strategies
- Discuss the concepts of primary, secondary and tertiary prevention
- Interpret research relating to the primary prevention of type 2 diabetes

Content Outline

- Prevalence of diabetes –global and Malaysia
- Concept of diabetes prevention
- Diabetes Prevention trials
- Summary

Prevalence of Diabetes 2021

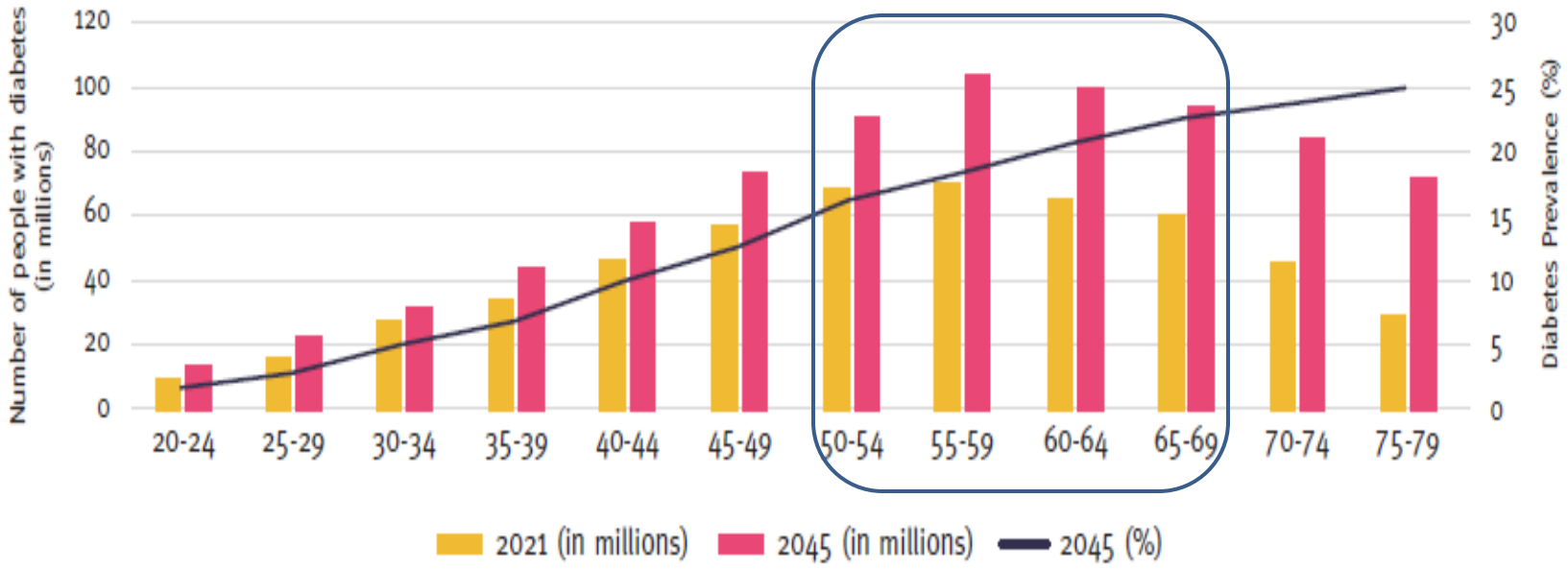
Global Prevalence of Diabetes 2000-2021



Adapted from IDF Atlas 2021

Diabetes Affect All Age Groups with Highest Prevalence from 50-69 years Old

Figure 3.1 Number of people with diabetes in adults (20–79 years) by age group in 2021 (columns) and estimated prevalence[i] across age groups in 2045 (black line)

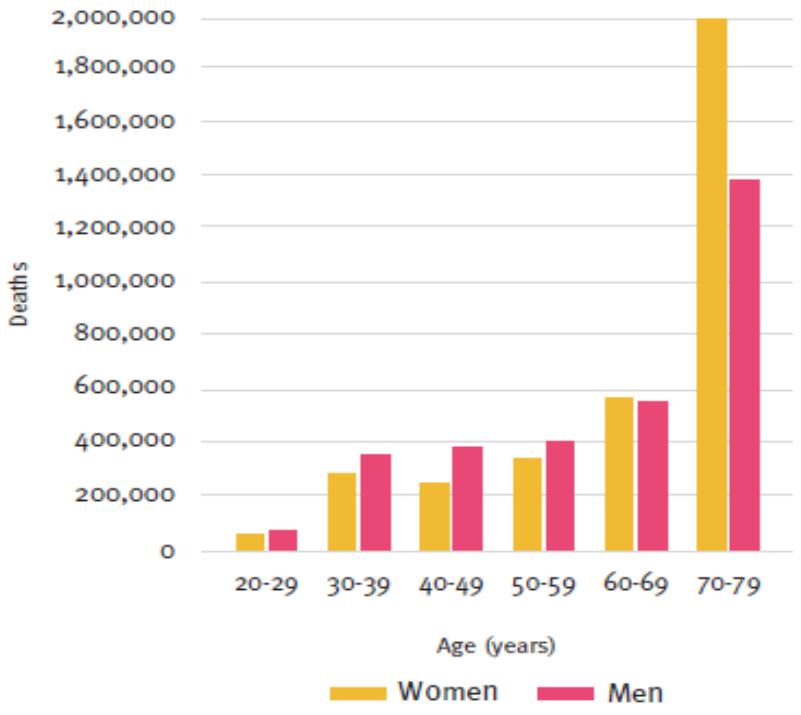


Adapted from IDF Atlas 2021

Diabetes Related Mortality

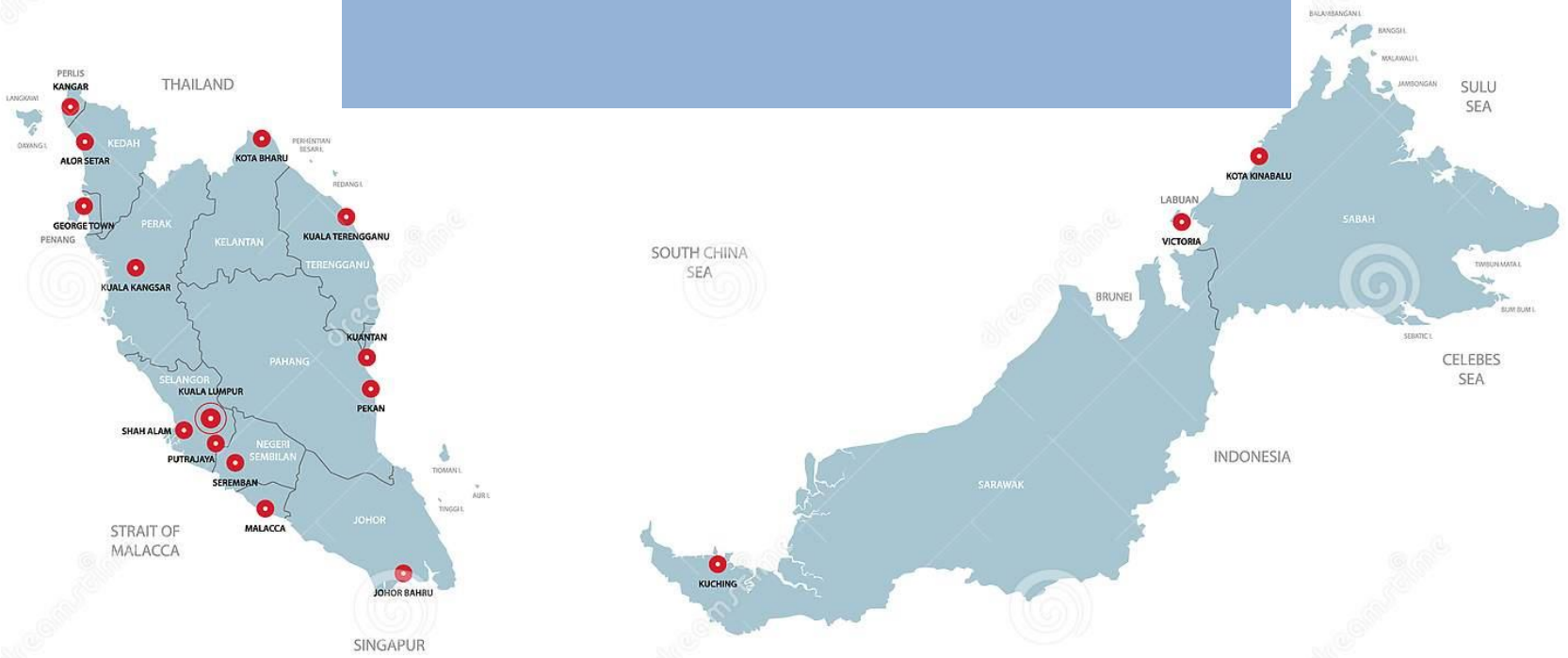
Approximately 6.7 million adults (20–79) are estimated to have died as a result of diabetes, or its complications in 2021

Figure 3.13 Number of deaths due to diabetes in adult (20–79 years), by age and sex in 2021



Adapted from IDF Atlas 2021

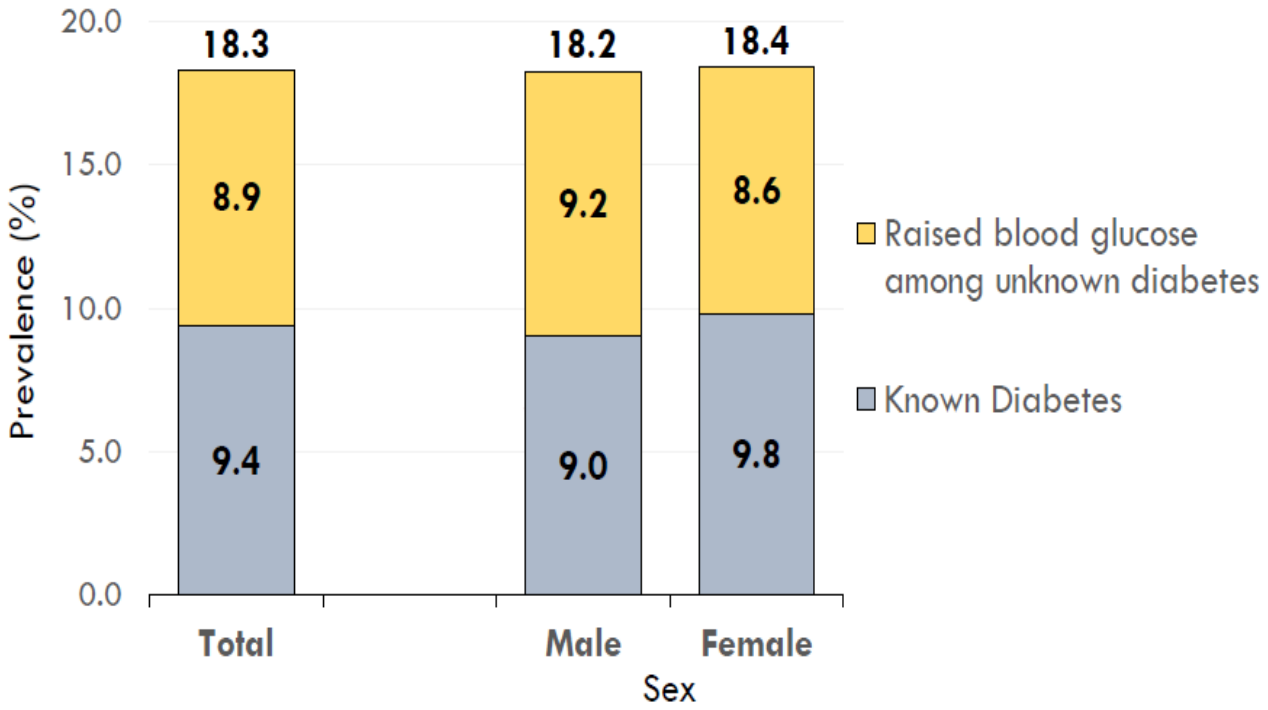
Diabetes in Malaysia



National Health and Morbidity Survey 2019

DIABETES

1) Known Diabetes
2) *Raised Blood Glucose Among Unknown Diabetes* (FBS ≥ **7.0 mmol/L** or RBS ≥ 11.1 mmol/L)



Estimated World Diabetes Prevalence (2019)[1]

World: 9.3%
Western Pacific: 9.6%
Indonesia: 6.2%
Singapore: 14.2%
Thailand: 8.3%

Proportion of Undiagnosed Diabetes[1]

Middle Income Countries: 52.6%

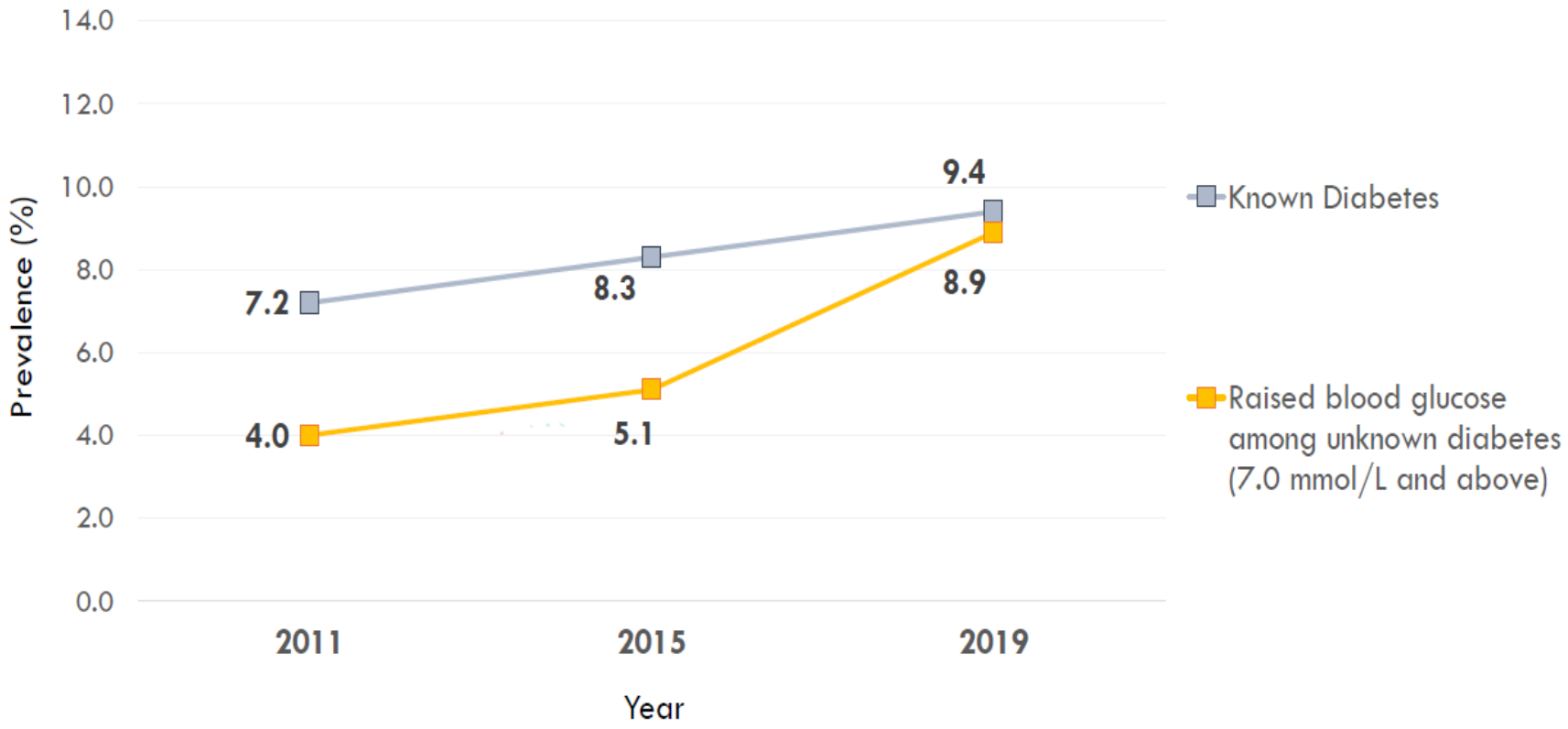
1. International Diabetes Federation. IDF Diabetes Atlas, 9th ed. Brussels, Belgium: 2019. Available at: http://www.diabetesatlas.org

Acknowledgement -Dr. Feisul Idzwan Mustapha

National Health and Morbidity Survey 2019

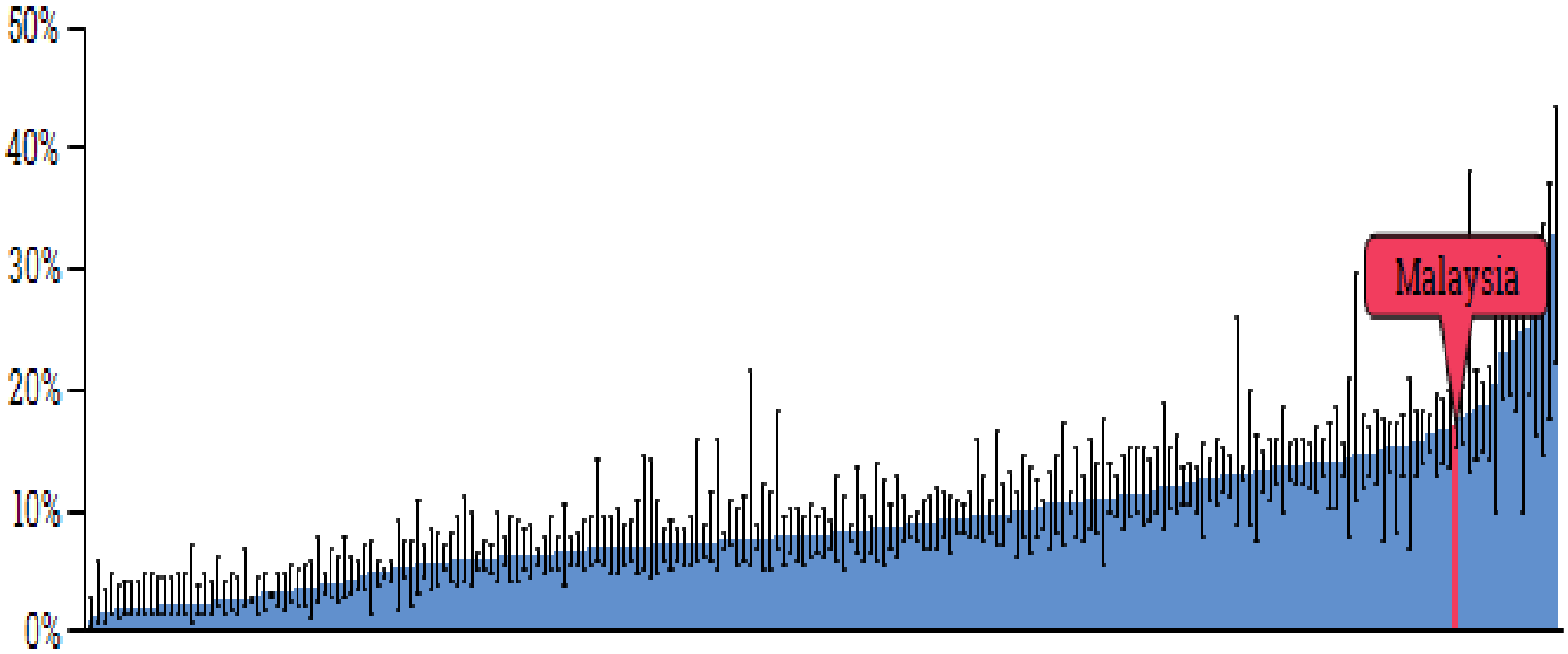
DIABETES

TREND – 2011 - 2019



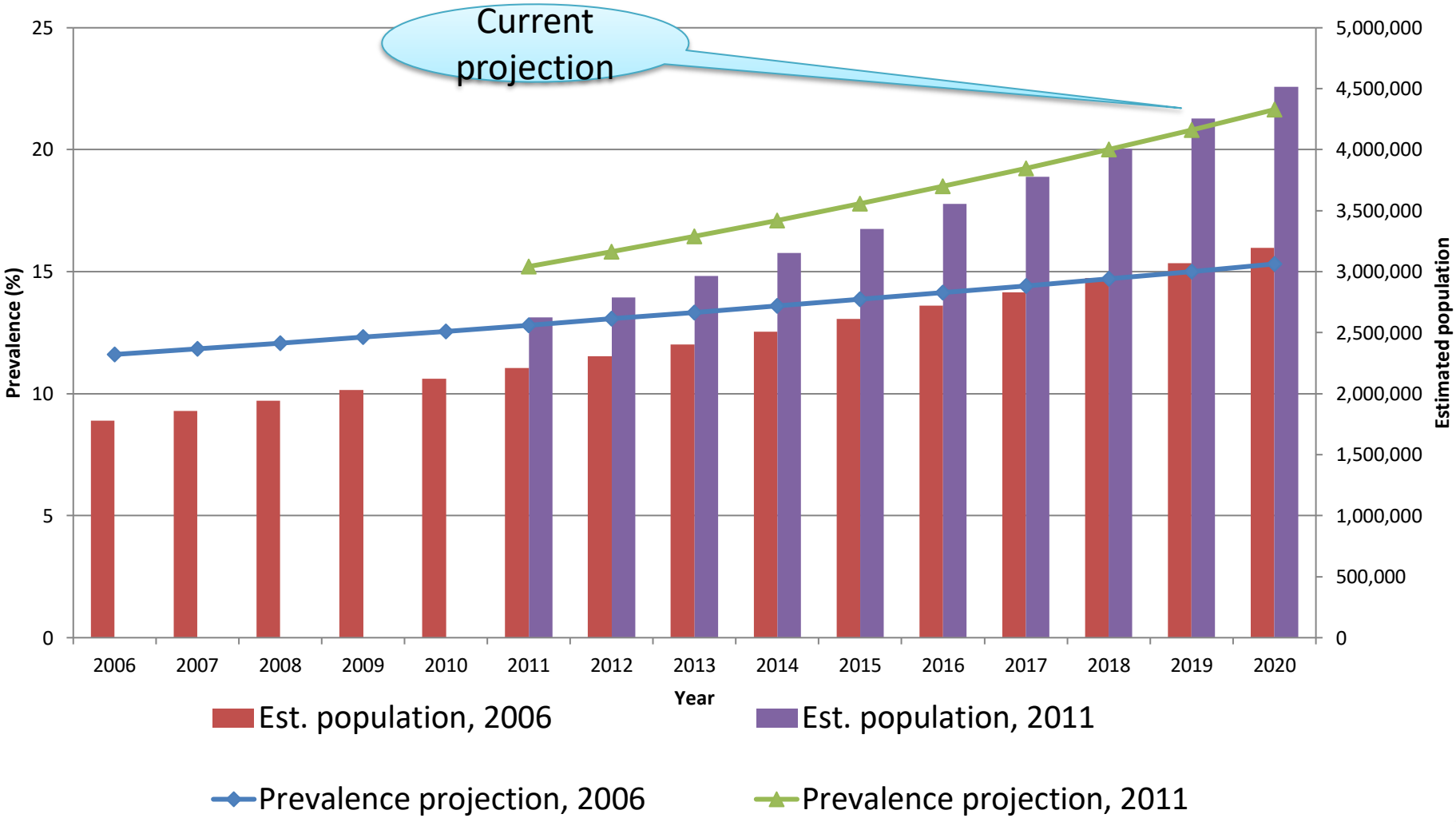
Acknowledgement -Dr. Feisul Idzwan Mustapha

Prevalence of diabetes in Malaysia as compared to other countries, 2017



Adapted from IDF Atlas 2017

Burden of Diabetes in Malaysia: Trends & Projections by 2020 (Adults age 18 years and above)



Acknowledged from Dr. Feisul Mustapha

Glycaemic Control-Primary Care

Year	No of subjects	Mean HbA1c%	Percentage achieved HbA1c <6.5%	Percentage achieved HbA1c <7%
2011	73,434	8.2	22.47	
2012	129,685	8.1	23.68	
2013	121,583	8.1	25.52	38.9
2014	115,204	8.0	28.67	41.4
2015	153,562	8.1	25.58	38.0
2016	160,348	8.1	22.7	38.7
2017	160,192	8.0	23.5	39.4
2018	157,821	8.0	28.2	
2019	165,978	7.9	27.6	
2020	902,991	7.8	30.7	
2021		7.8	35.3	
2022	821,282	7.8	34.9	

Source : Malaysia Nation Diabetes Registry: Diabetes Clinical Audit 2022

Glycaemic Control- Tertiary Care Malaysia

DiabCARE 2008

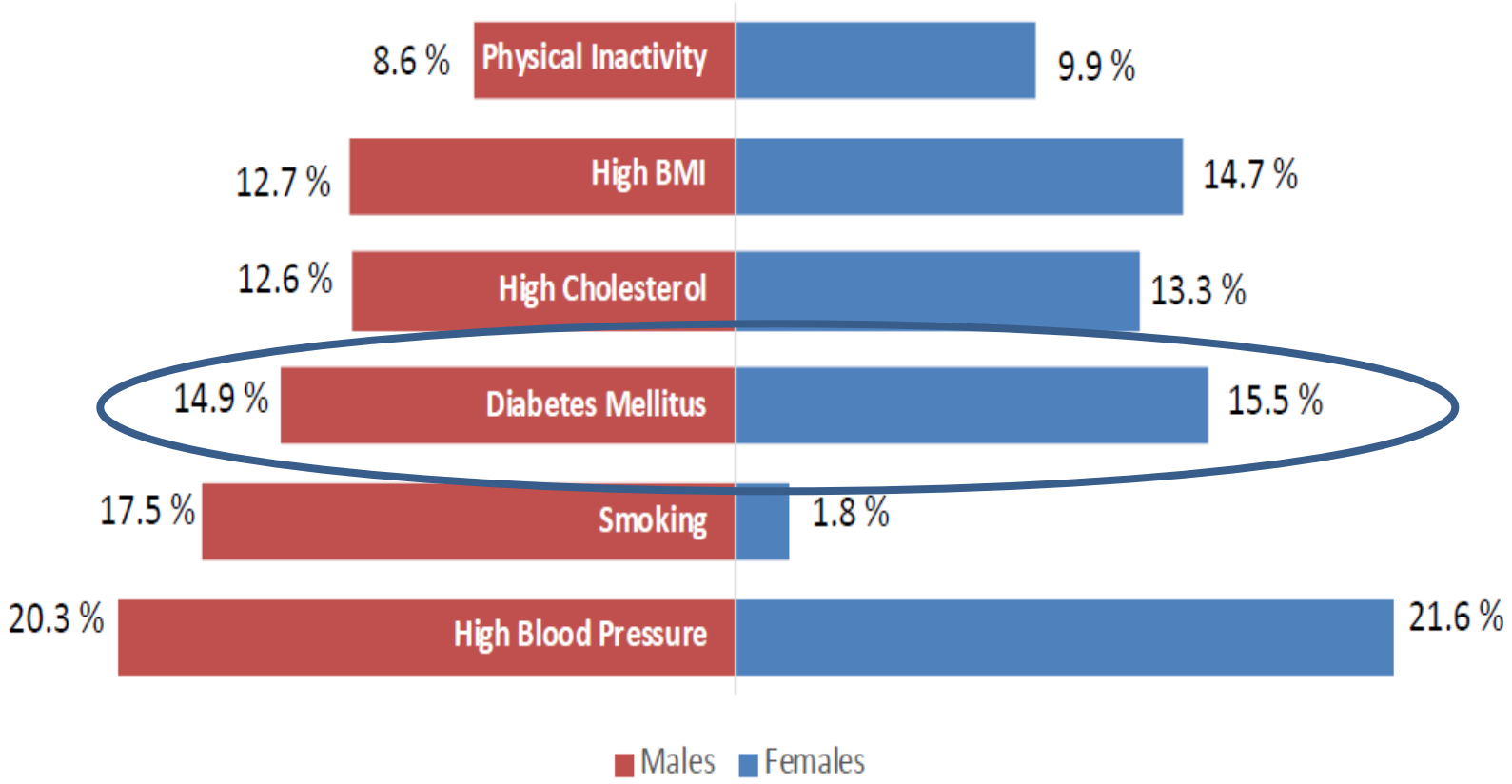
- N= ~1549 T2DM
- MOH & Academic Tertiary hospitals
- **Results**
- HbA1c -8.66%(mean)
- 22% achieved HbA1c <7%

DiabCARE 2013

- N=1668 T2DM
- MOH & Academic Tertiary hospitals
- **Results**
- HbA1c - 8.52% (mean)
- 23.7% achieved HbA1c <7%

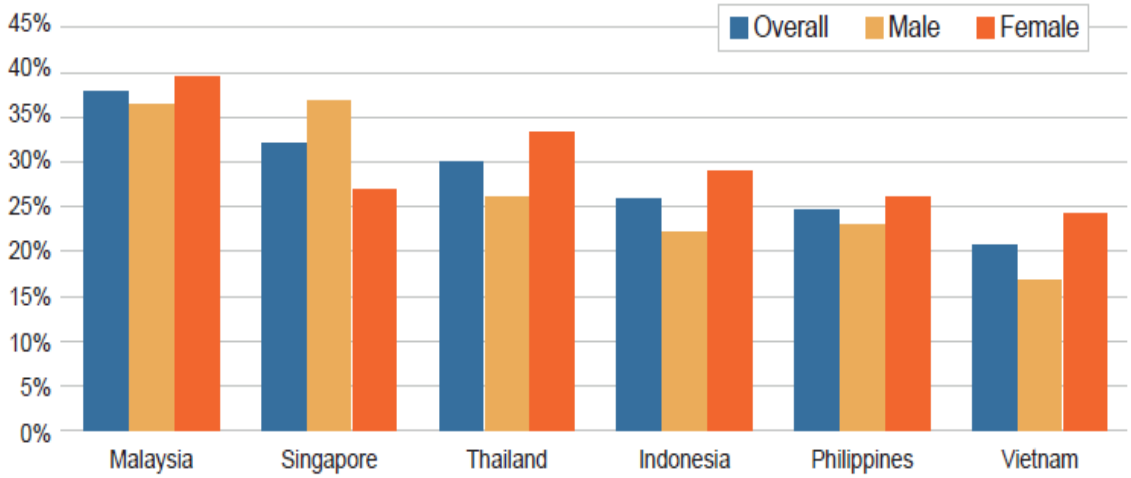
Mafauzy M.,Hussein Z, Chan SP. The Status of Diabetes Control in Malaysia: Results of DiabCare 2008 Med J Malaysia 2011

Deaths Attributable to Major Risk Factors, Malaysia, 2014



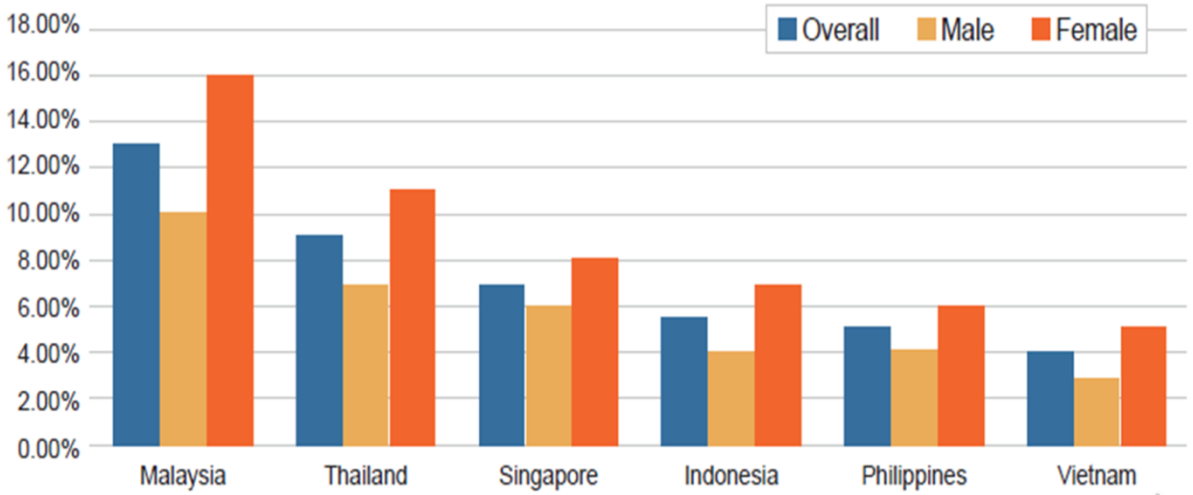
Burden of Disease Attributable to Major Risk Factors, Institute for Public Health; Dr Mohd Azahadi Omar)

Percentage of Overweight (BMI ≥ 25) and Obese (BMI ≥ 30) Adult Population In Malaysia



Overweight Adults

Obese Adults

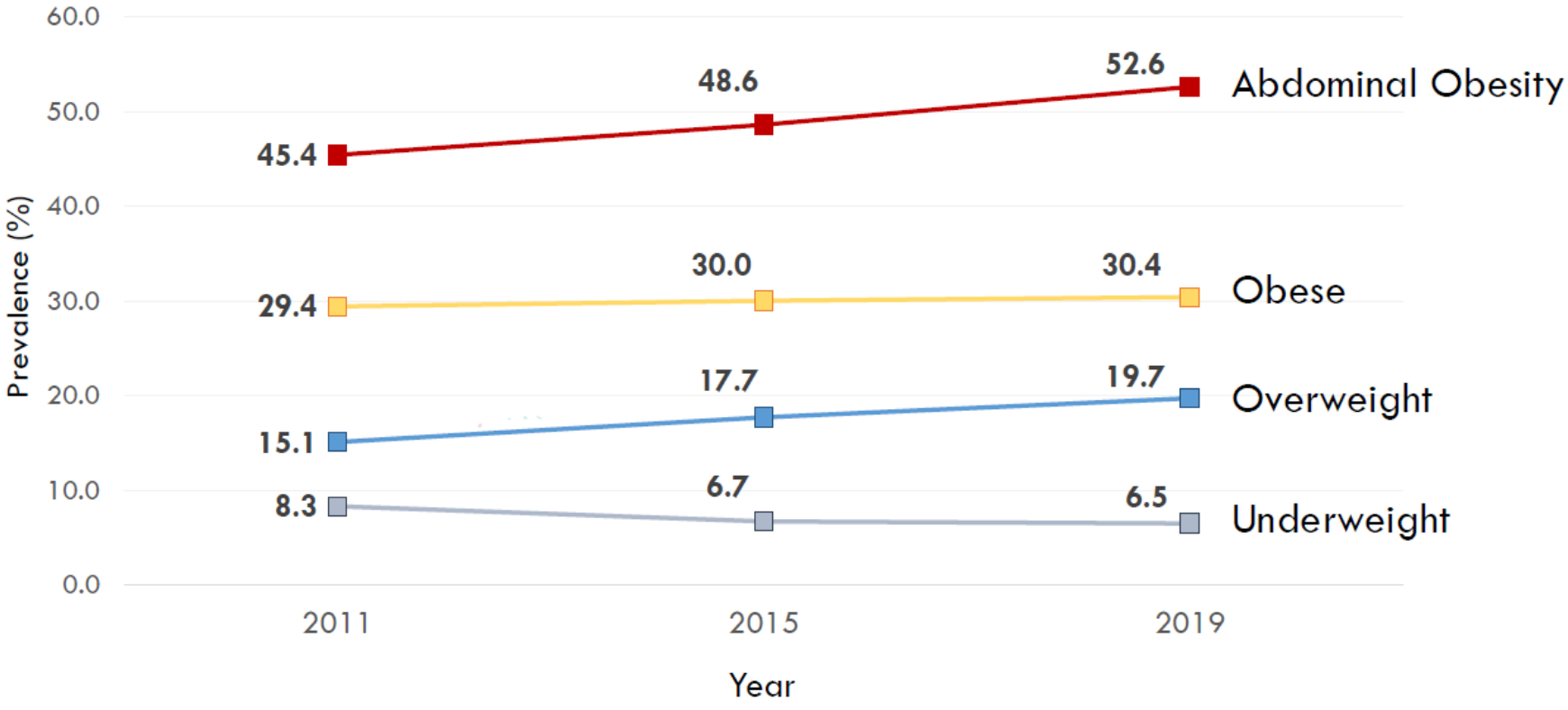


Schoepp TM. Penang Institute 2017

National Health and Morbidity Survey 2019

N= 14 965

TREND – 2011 - 2019



Acknowledgement -Dr. Feisul Idzwan Mustapha

Concept of Diabetes Prevention

- Primary prevention involves preventing diabetes from occurring in susceptible individuals
- Secondary prevention involves implementing strategies to prevent complications in those who already have diabetes
- Tertiary prevention refers to reducing the risk of complications progressing further

Activity 1

- Primary Diabetes Prevention involves preventing diabetes from occurring in susceptible individuals
- Prepare a list of those who are at risk of developing Type 2 diabetes
- Compare your answer with the following slide

High Risk Individuals for Type 2 Diabetes

- Family history
- Ethnicity
- History of Impaired Glucose Tolerance (IGT)/ Impaired Fasting Glucose (IFG)
- History of gestational Diabetes or delivery of macrosomic baby ≥ 4kg

- Polycystic ovarian cyst
- Hypertension
- Dyslipidemia
- Abdominal or central obesity
- Overweight
- Vascular Disease
- Physical inactivity
- Other clinical conditions
- Special populations

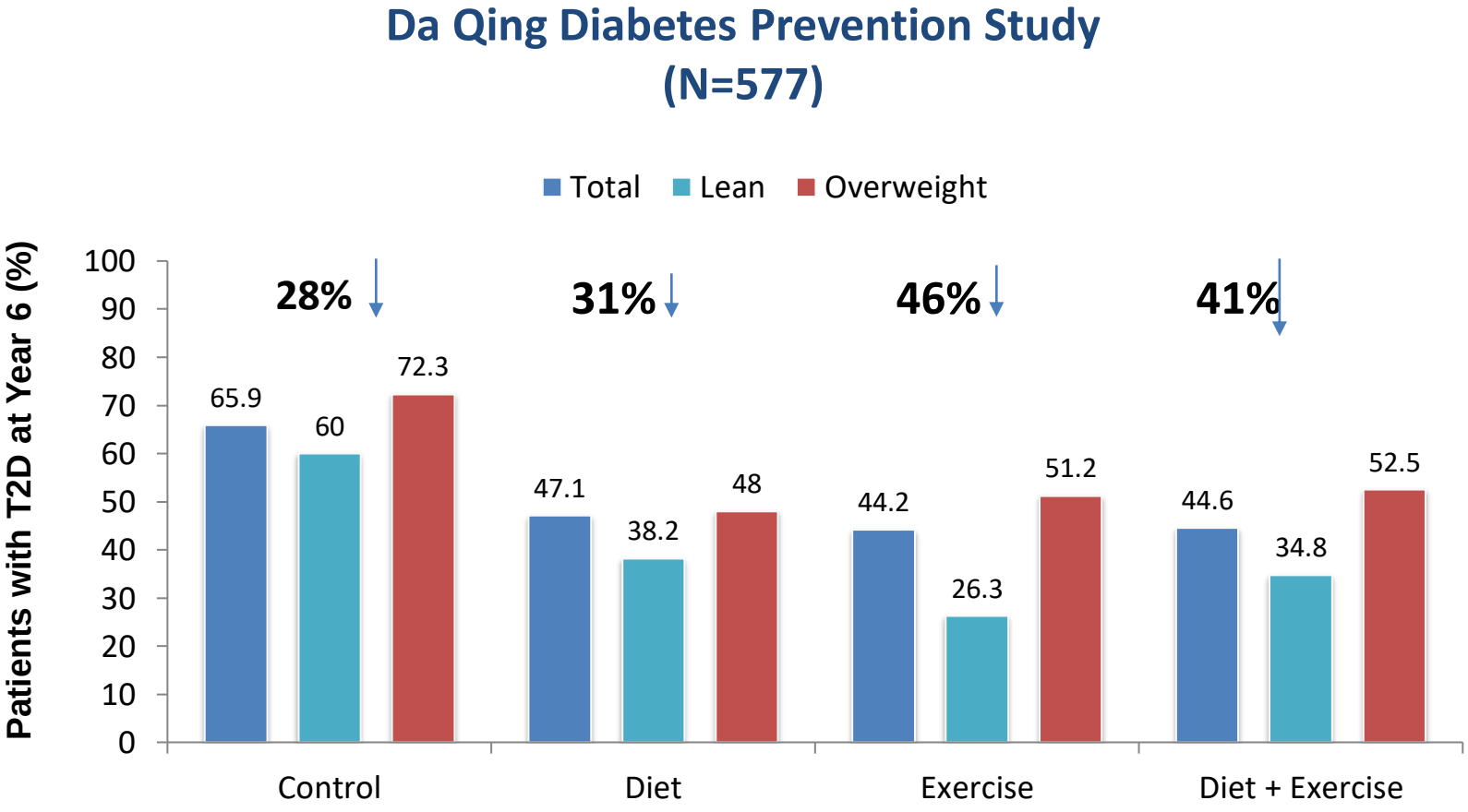
CPG T2DM Malaysia 2015

Can Diabetes be prevented or Delay the onset?

Diabetes Prevention Lifestyle Studies

- Da Qing Diabetes Prevention Study, China
- Finish Diabetes Prevention Study, Finland
- Diabetes Prevention Program USA
- Prevention of Type 2 diabetes: A Japanese Trial in IGT men

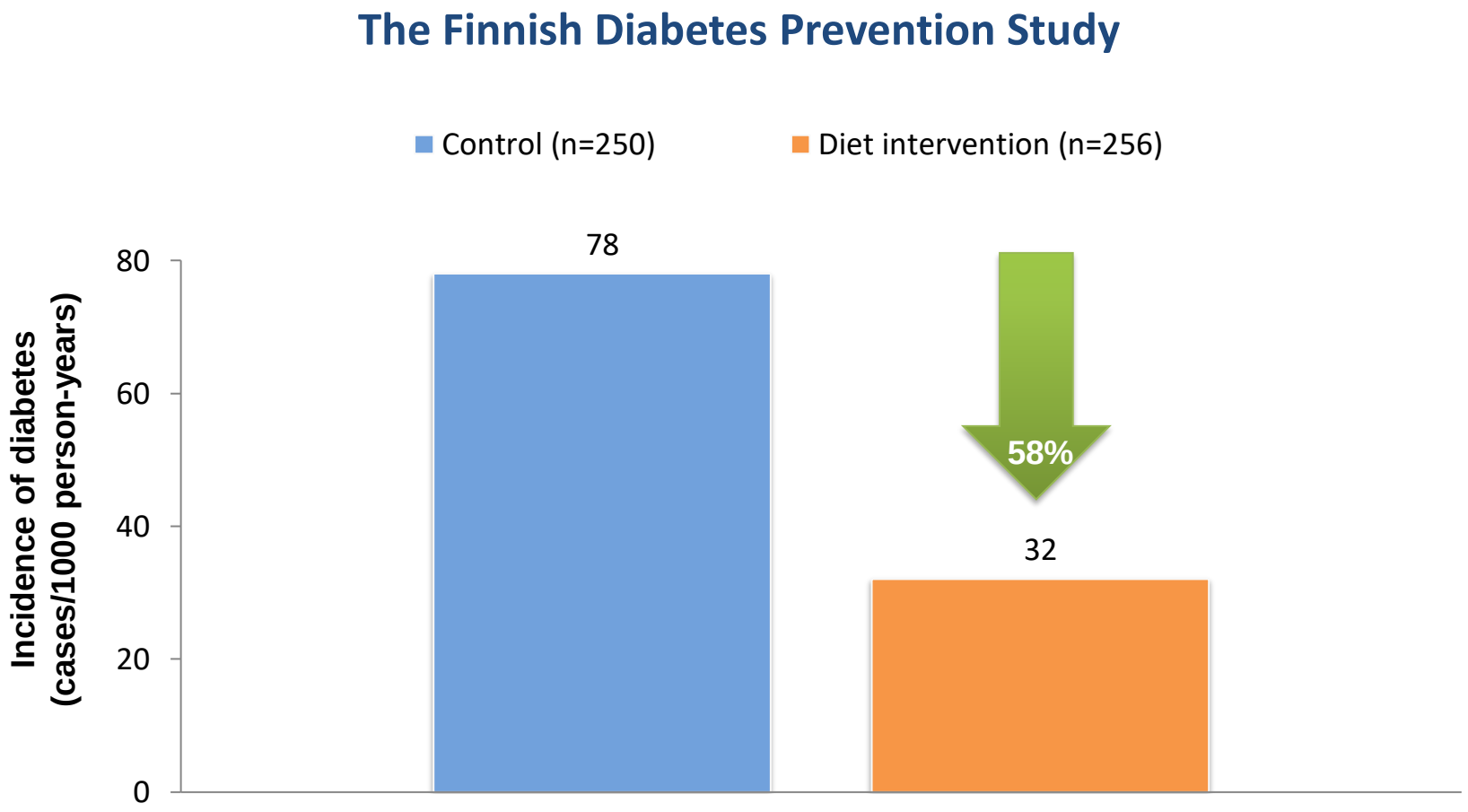
Cumulative Incidence of Diabetes in Asian Patients with IGT



IGT, impaired glucose tolerance; T2D, type 2 diabetes.

Pan XR, et al. *Diabetes Care*. 1997;20:537-544.

Cumulative Incidence of Diabetes Over 4 Years

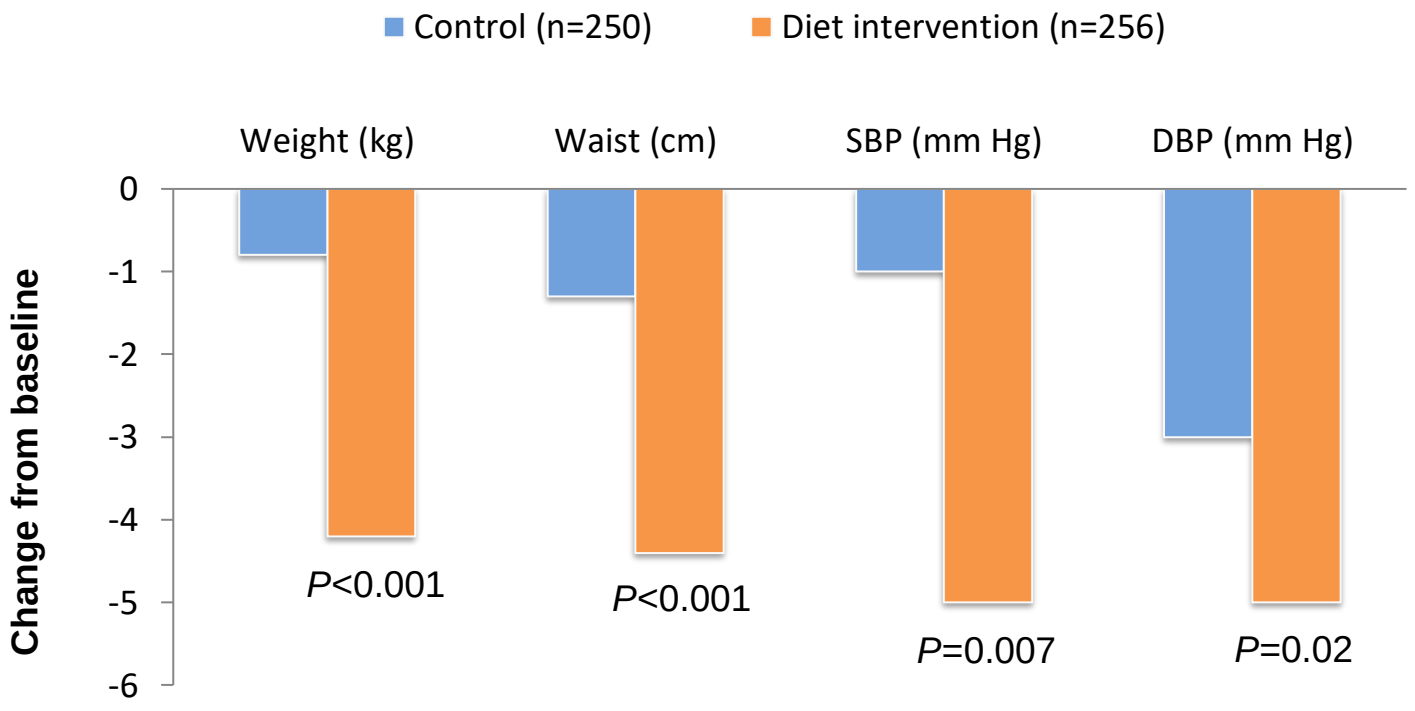


DBP, diastolic blood pressure; SBP, systolic blood pressure.

Tuomilehto J, et al. *N Engl J Med*. 2001;344:1343-1350.

Effect of Lifestyle Modification on Weight and Blood Pressure

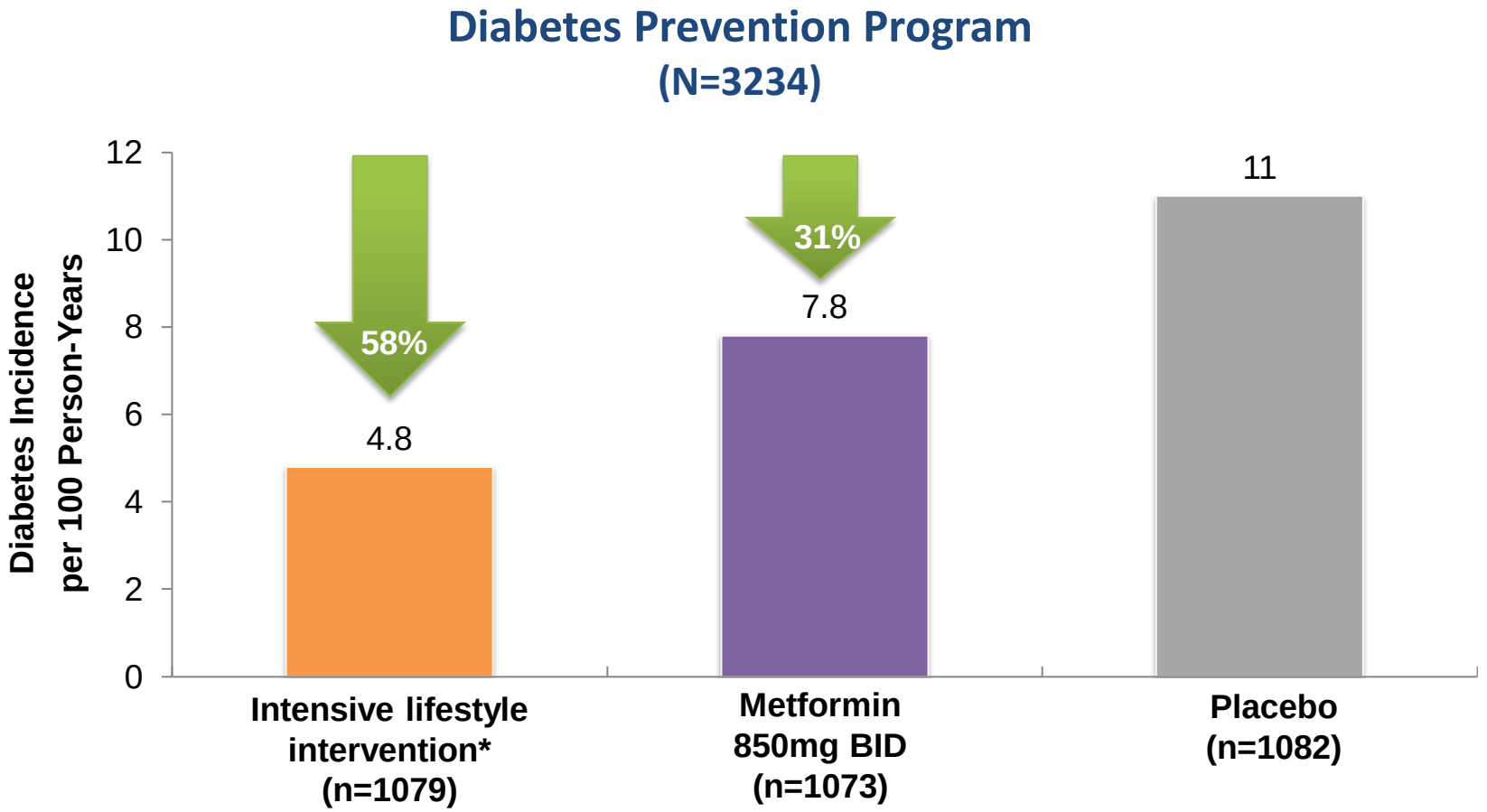
The Finnish Diabetes Prevention Study



DBP, diastolic blood pressure; SBP, systolic blood pressure.

Tuomilehto J, et al. *N Engl J Med*. 2001;344:1343-1350.

Intensive Lifestyle Intervention Effectively Prevents Progression From IGT to T2D

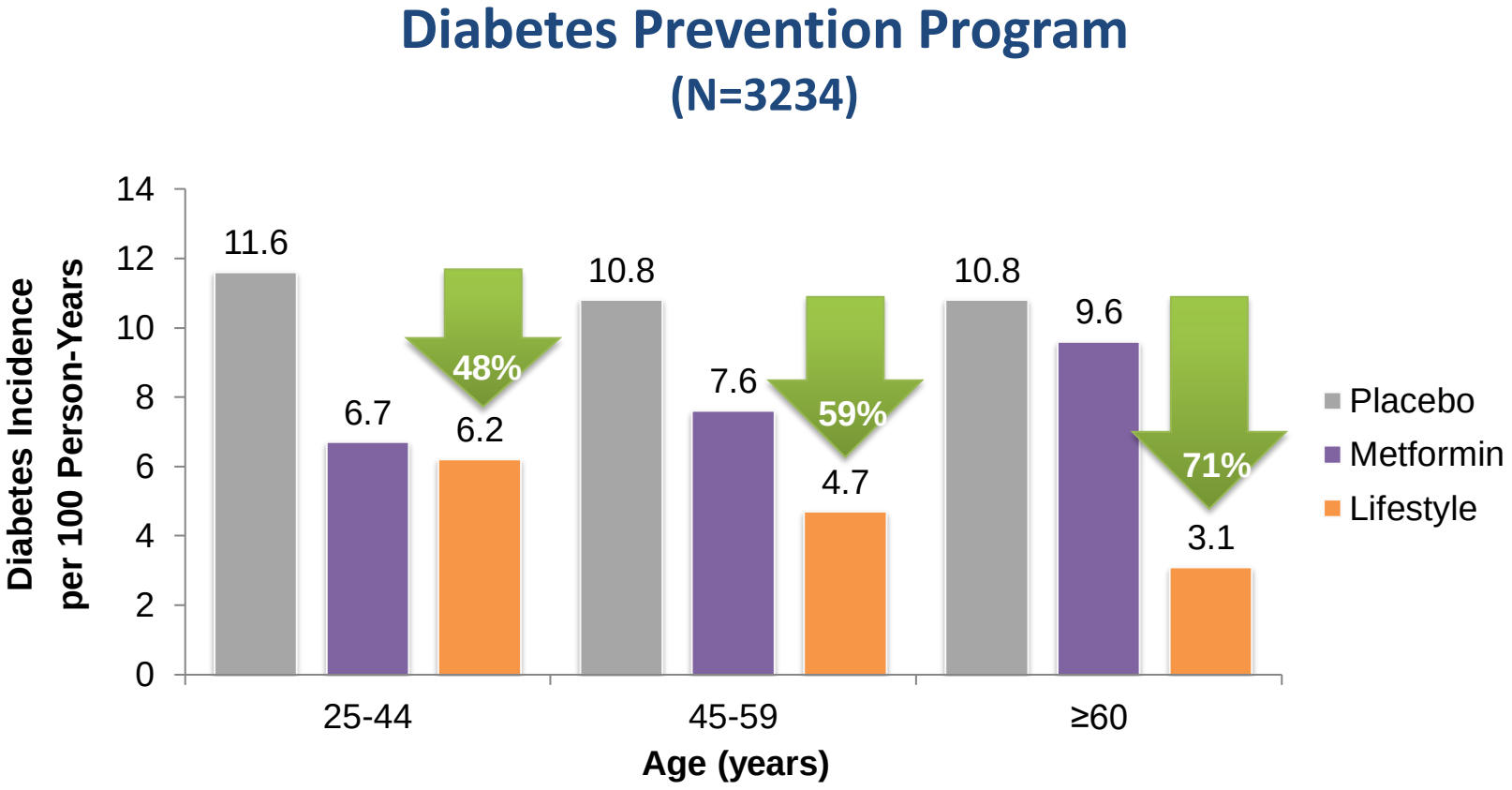


*Goal: 7% reduction in baseline body weight through low-calorie, low-fat diet and ≥150 min/week moderate intensity exercise .

IGT, impaired glucose tolerance; T2D, type 2 diabetes.

DPP Research Group. N Engl J Med. 2002:346;393-403

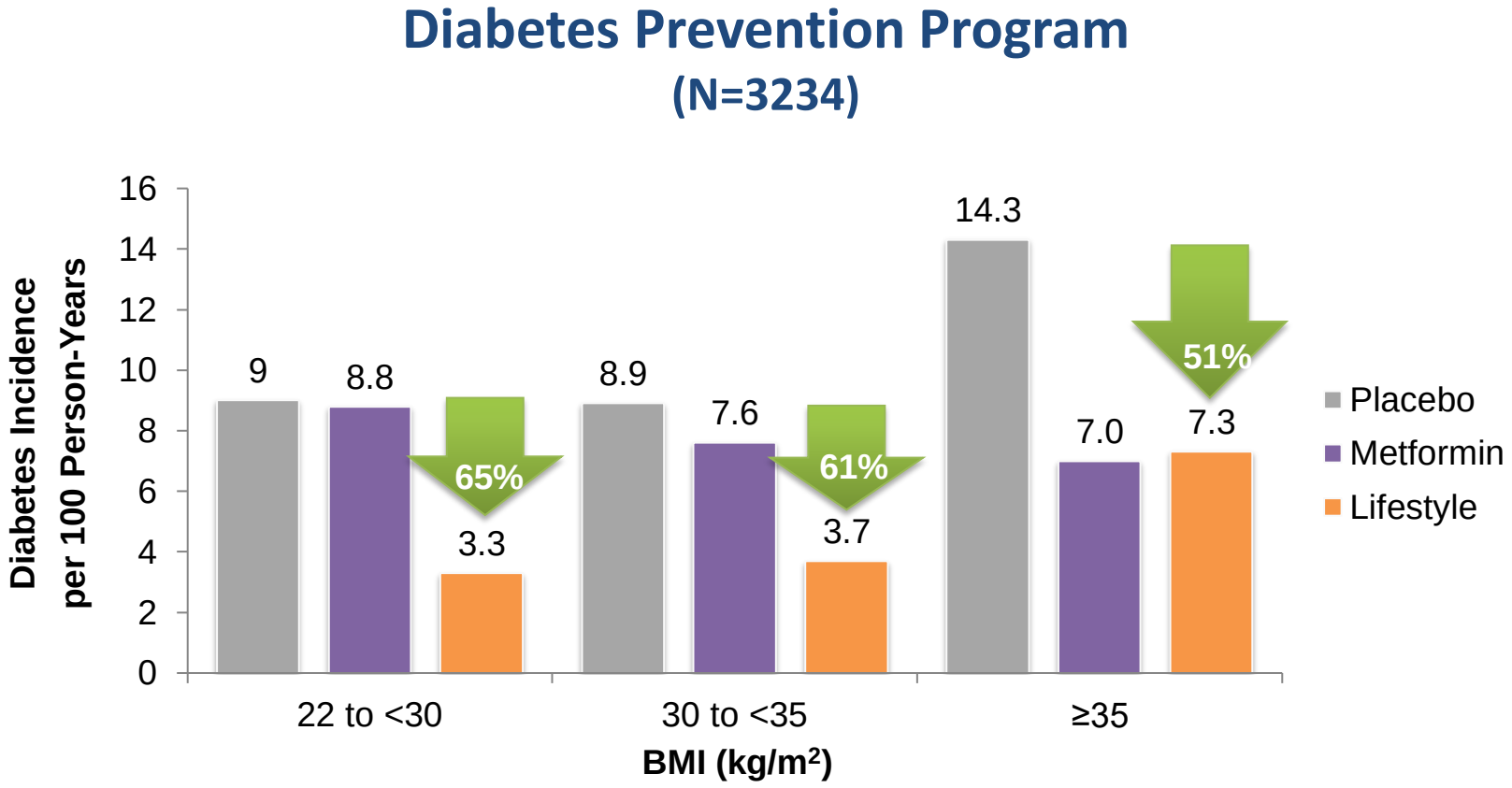
Lifestyle Intervention More Effectively Prevents Diabetes as Populations Age



*Goal: 7% reduction in baseline body weight through low-calorie, low-fat diet and ≥150 min/week moderate intensity exercise .

DPP Research Group. N Engl J Med. 2002:346;393-403

Effectiveness of Lifestyle Intervention for Diabetes Prevention Wanes as Weight Increases



*Goal: 7% reduction in baseline body weight through low-calorie, low-fat diet and ≥150 min/week moderate intensity exercise .

DPP Research Group. N Engl J Med. 2002:346:393-403

Type 2 Diabetes Prevention in Women With a History of Gestational Daibetes

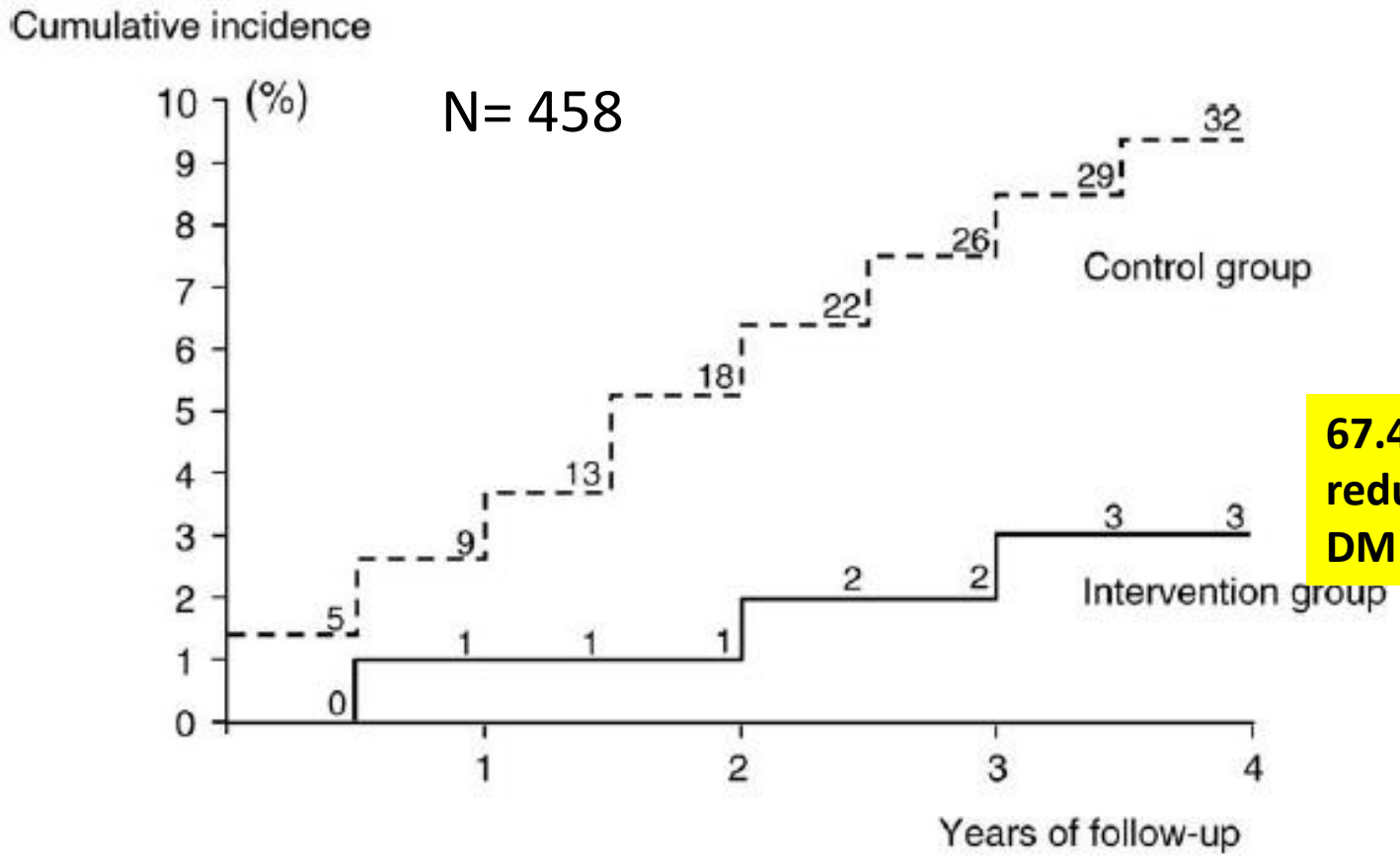
- Findings from the DPP
  - Progression to diabetes is more common in women with a history of gestational diabetes (GDM) vs those without, despite equivalent degrees of Impaired glucose tolerance (IGT) at baseline
- Both intensive lifestyle and metformin are highly effective in delaying or preventing diabetes in women with IGT and a history of GDM

DPP, Diabetes Prevention Program; GDM, gestational diabetes mellitus; IGT, impaired glucose tolerance; T2D, type 2 diabetes.

Ratner RE, et al. J Clin Endocrinol Metab. 2008;93:4774-4779.

Intensive Lifestyle Intervention Effectively Prevents Progression From IGT to T2D

Prevention of Type 2 diabetes: A Japanese Trial in IGT men



67.4% reduction in DM incidence

KosaKa K. Diabetes Research and Clinical Practice 2005

Prevention of Type 2 Diabetes With Medications

Intervention	Follow-up Period	Reduction in Risk of T2D (P value vs placebo)
Metformin[1]	2.8 years	31% (*P*<0.001)
Acarbose[2]	3.3 years	25% (*P*=0.0015)
Rosiglitazone[3]	3.0 years	60% (*P*<0.0001)
Orlistat[4]	4 years	37% (*P*=0.0032)

1.DPP Research Group. N Engl J Med. 2002
2. STOP-NIDDM Trial Research Group. Lancet. 2002
3. DREAM Trial Investigators. Lancet. 2006
4.Torgerson JS, et al. Diabetes Care. 2004

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Summary of T2DM Lifestyle Prevention Trials

Study	Country	N	Baseline BMI (kg/m2)	Intervention Period (year)	RRR	NNT
Da Qing	China	577	25.8	6	51	30
Diabetes Prevention Study	Finland	523	31	4	39	22
Diabetes Prevention Program (DPP)	USA	3234	34	2.8	58	21
Prevention of T2DM Japanese Trail	Japan	458	24	4	67.4	

Lifestyle interventions were effective in Prevention of T2DM in short term

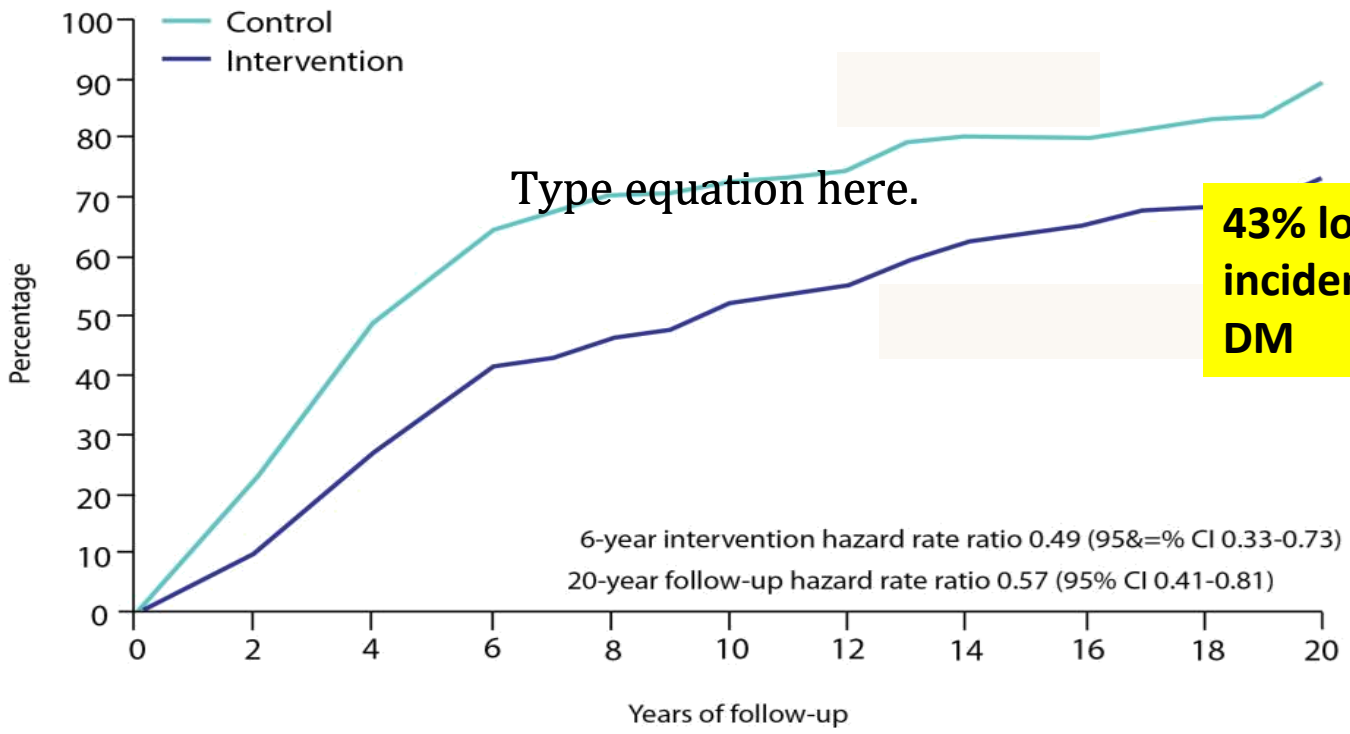
In DPP, Lifestyle intervention was more effective than medication

Lifestyle Long Term Prevention Trials

- 20 years Da Qing Diabetes Prevention Outcomes Study, China
- 7 years Follow-up Finish Diabetes Prevention Study, Finland
- 10 years Follow-up Diabetes Prevention Program USA

20-Year Cumulative T2D Incidence in Asian Patients with IGT

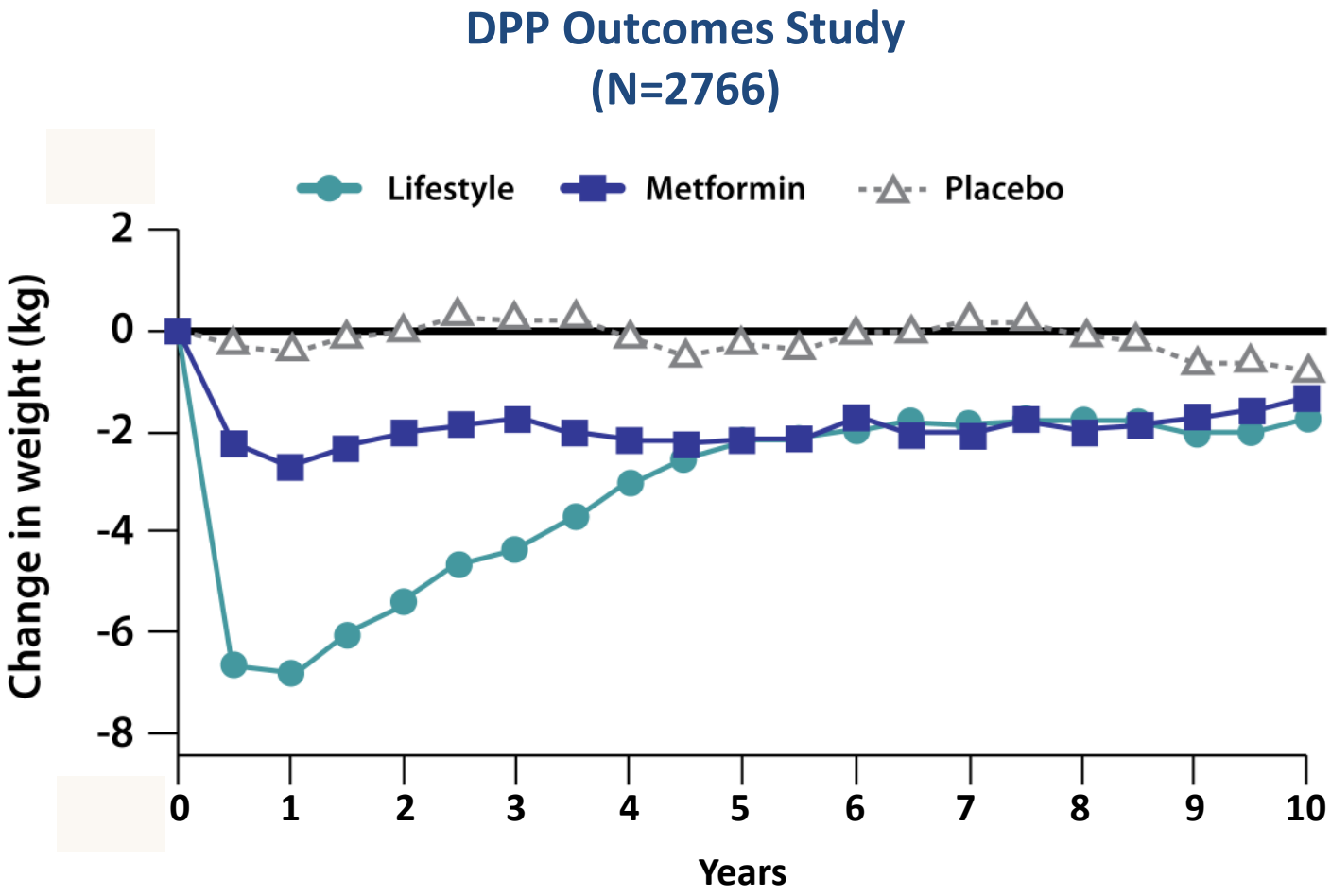
Da Qing Diabetes Prevention Study



IGT, impaired glucose tolerance; T2D, type 2 diabetes.

Li G, et al. *Lancet*. 2008;371:1783-1789.

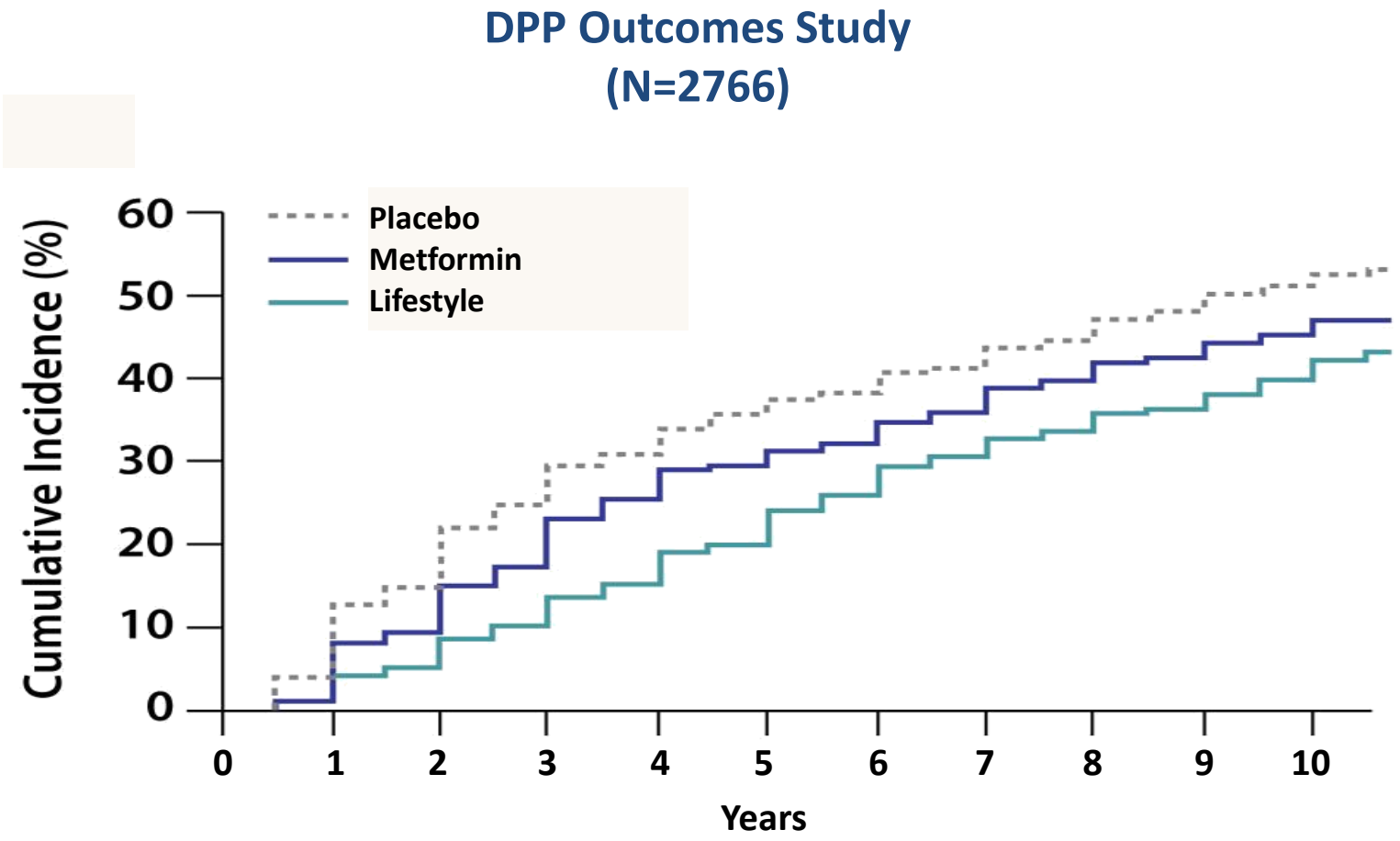
Maintenance of Long-Term Weight Loss



DPP, Diabetes Prevention Program; T2D, type 2 diabetes.

DPP Research Group. *Lancet*. 2009;374:1677-1686.

10-Year Incidence of T2D

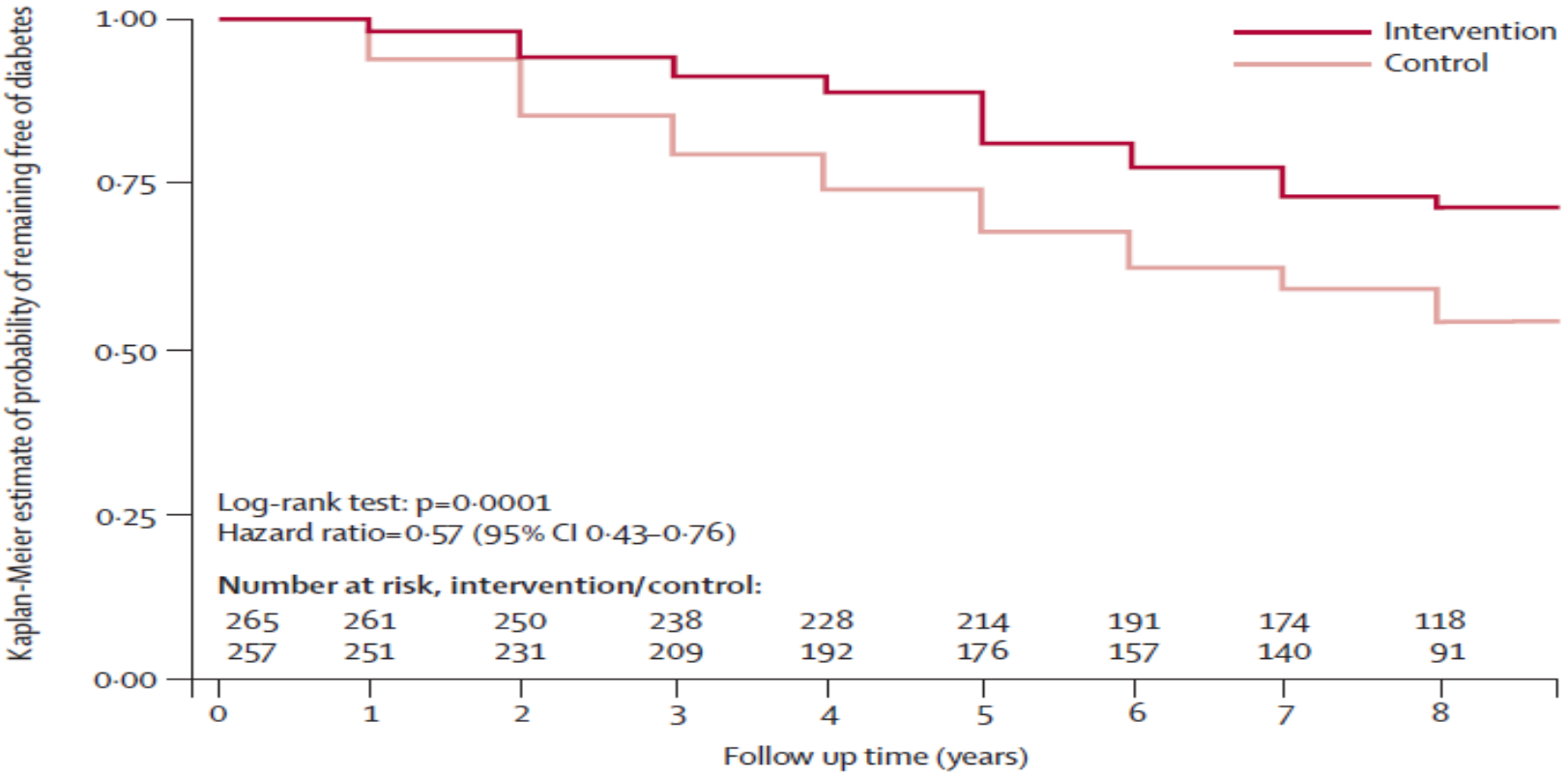


DPP, Diabetes Prevention Program; T2D, type 2 diabetes.

DPP Research Group. *Lancet*. 2009;374:1677-1686.

7-Year Incidence of T2D

Follow-up Finnish Prevention Study
(N=522)



Lindstrom J et al. Lancet 2006

T2DM Lifestyle Long-term Follow-up Prevention Trials

Study	Country	N	Intervention Period (year)	RRR Baseline 1st study	RRR Long-term Follow-up
Da Qing-follow-up	China	426	20	51	43
Diabetes Prevention follow-up study	Finland	522	7	39	23
Diabetes Prevention Program Outcomes Study	USA	2766	10	58	34% Lifestyle 18% Metformin

NNT- number needed to treat
RRR- relative risk reduction
T2D- type 2 diabetes.

Summary of Long-term Studies

- The extended reductions in diabetes incidence in the studies could be explained by:

- ❑ Lifestyle interventions could have led to changes in usual behaviour that were maintained beyond the period of the study intervention.
- ❑ The interventions might have led to changes in the preventive care and health promotion efforts provided by community clinics that had effects beyond the intervention period.
- ❑ Lifestyle intervention might lead to some type of metabolic memory
- ❑ The effects of lifestyle interventions extend across cultures

Summary of Diabetes Prevention Studies

- We now know that type 2 diabetes can be delayed in people who have Pre-Diabetes.
- Work needs to be done at community levels to reduce obesity by increase physical activity and reducing people's caloric and fat intake.
- A number of initiatives could be used to create awareness, promote healthy living and prevent or delay diabetes

Message to People with Diabetes and at Risk with Diabetes

- Lifestyle Intervention is effective even for long-term effect (up to 20 years) as shown in the 3 long-term follow-up studies

Summary of Part 1

- The global prevalence of diabetes has reached an epidemic level
- Lifestyle intervention and some medications are effected in diabetes prevention across culture.
- Lifestyle intervention that involve adoption of healthy diets and increased physical activity is more effective than medication in diabetes prevention


Thank you
for listening