



India's first nationwide longitudinal real-world study on T2DM (LANDMARC) – trends in complications and management

Overview

01

What was known prior to the LANDMARC study?

02

What did the 1-year results of LANDMARC reveal?

03

What are the evidences emerging out of these results for the first time in India?

04

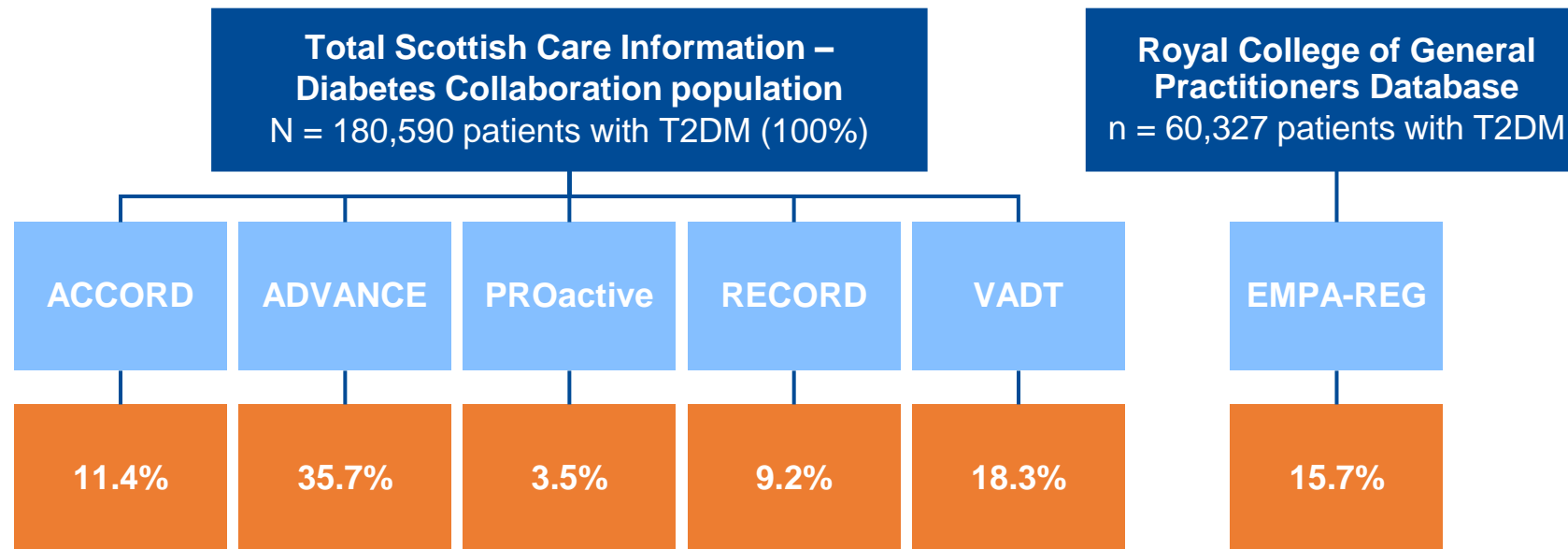
What are the clinical implications of these findings?



What was known prior to the LANDMARC study?

Majority of patients are not represented in RCTs

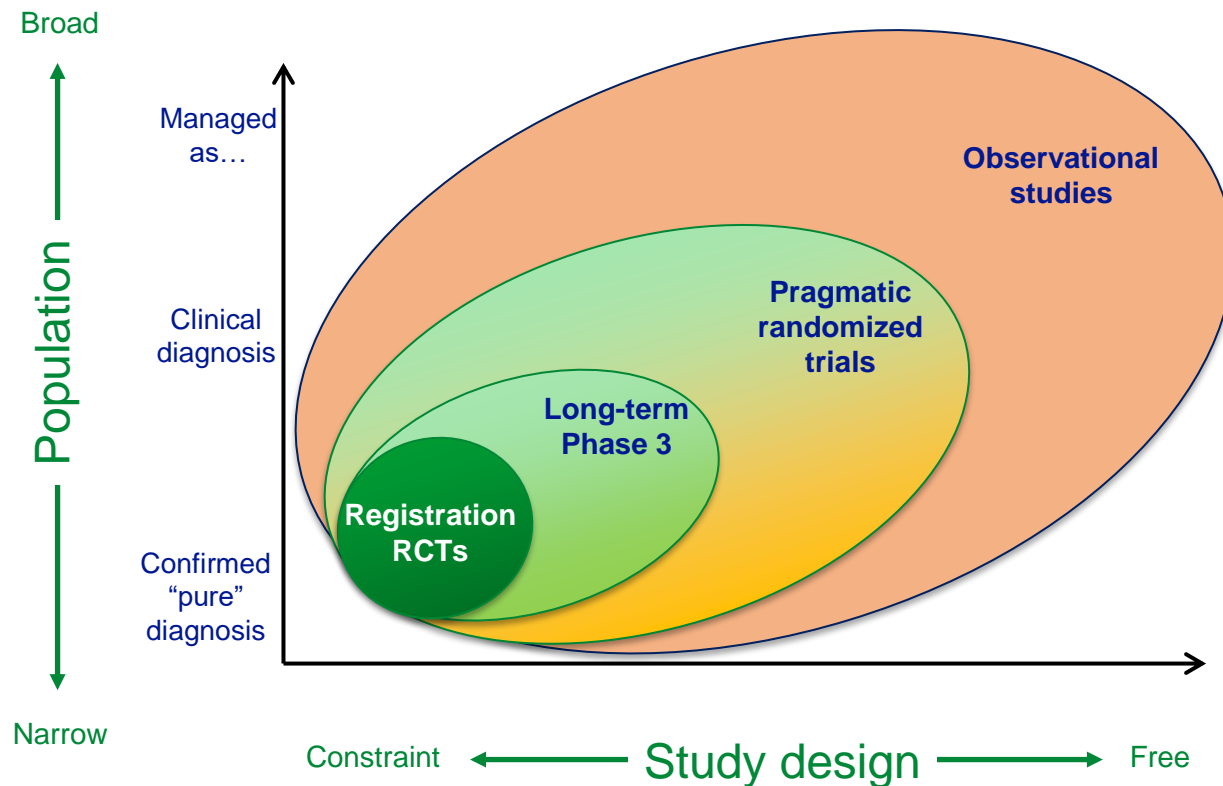
How many real-world patients with T2DM would be eligible for landmark diabetes RCTs?



Saunders C, et al. Diabet Med 2013;30:300–8
McGovern A, et al. Diabetes Ther. 2017;8:365–76

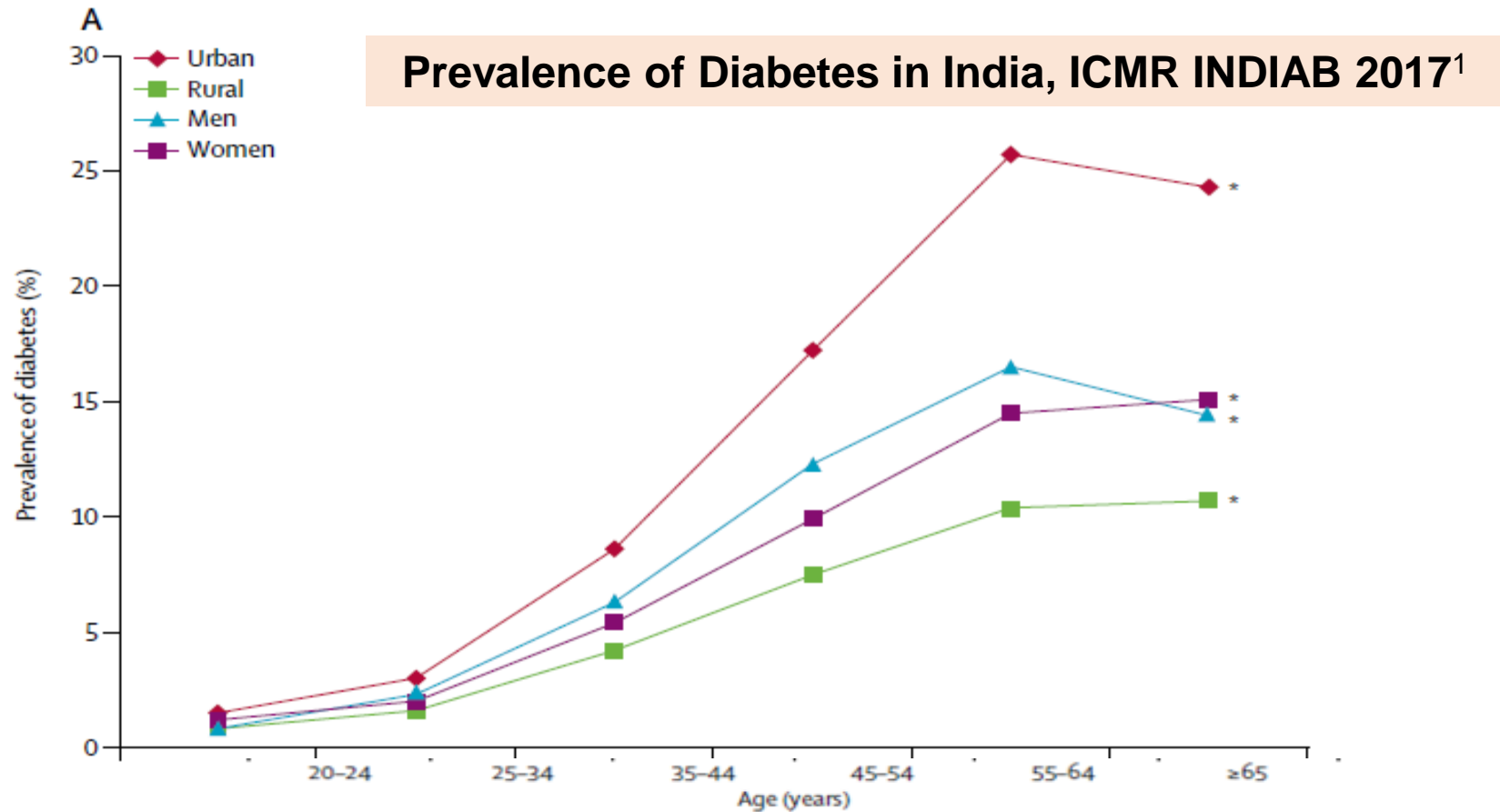
Why real-world evidence?

Patients seen in real-world practice may be “Diverse and complex”



- Clinical trial outcomes & actual clinical outcomes (in real world practice) tell different stories
- Real-world evidence (RWE) helps to answer questions that randomized clinical trials (RCTs) do not address
- Unlike RWE, RCTs are typically highly selective, often excluding people—
 - Older than 65 years
 - With comorbidities
 - On multiple drugs

Most large-scale Indian studies are cross-sectional



Age, gender, and area-specific prevalence of diabetes in 15 states in India *p for trend <0.0001

ICMR: Indian Council of Medical Research; INDIAB: Indian Council of Medical Research India DIABetes

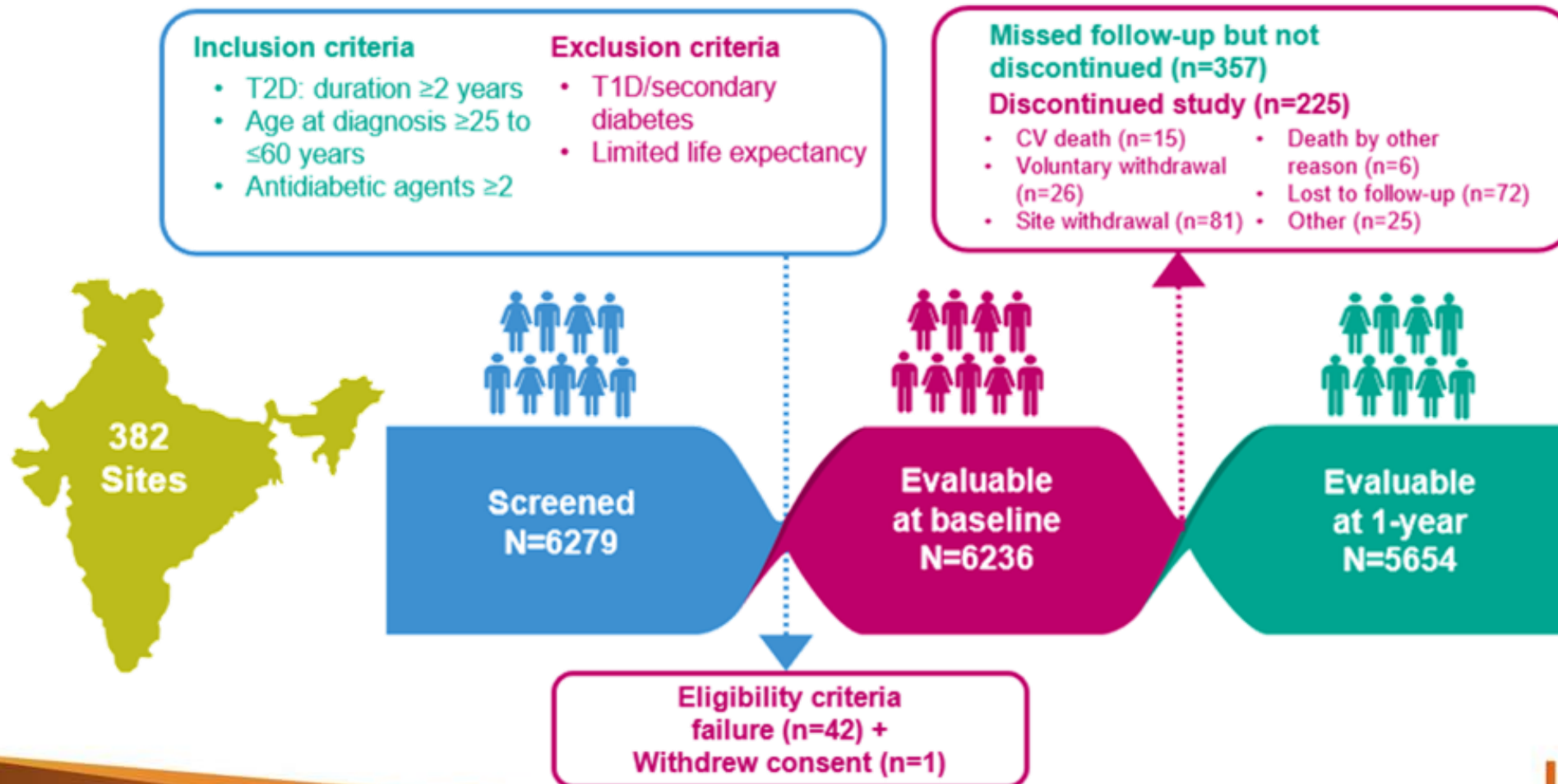


What is the LANDMARC study?

How does it bridge the data gap?

LANDMARC: First of its kind nationwide longitudinal real-world study

Objective: To understand the micro- and macrovascular complications, glycemic control, and time to treatment adaptation in Indian subjects with T2DM over a follow-up period of 3 years.





What did the 1-year results of LANDMARC reveal?

What are the evidences emerging out of these results for the first time in India?

Demographics: Overall

Parameters	Total
Duration of T2DM (years), mean (SD)	8.6 (5.6)
Age, years, mean (SD)	52.1 (9.1)
Age groups, years, n (%)	
≤30	61 (1.0)
31-49	2190 (35.1)
50-65	3557 (57.0)
≥66	428 (6.9)
Gender, n (%)	
Men	3532 (56.6)
Women	2704 (43.4)
Body mass index (kg/m²), n	
Mean (SD)	27.2 (4.6)
Body mass index (kg/m²) groups, n (%)	
Underweight (<18.0)	44 (0.7)
Normal (18.0-22.9)	904 (14.5)
Overweight (23.0-24.9)	1121 (18.0)
Obese (≥25.0)	4152 (66.7)

n = Number of subjects with non-missing results at the visit; SD, standard deviation

Avg. age at diagnosis of T2D in India is ~43 years

>80% are either overweight or obese

Demographics: Metro & Non-metro

Metros – Delhi, Mumbai, Kolkata, Chennai, Bengaluru & Hyderabad

Non- metros – All other cities

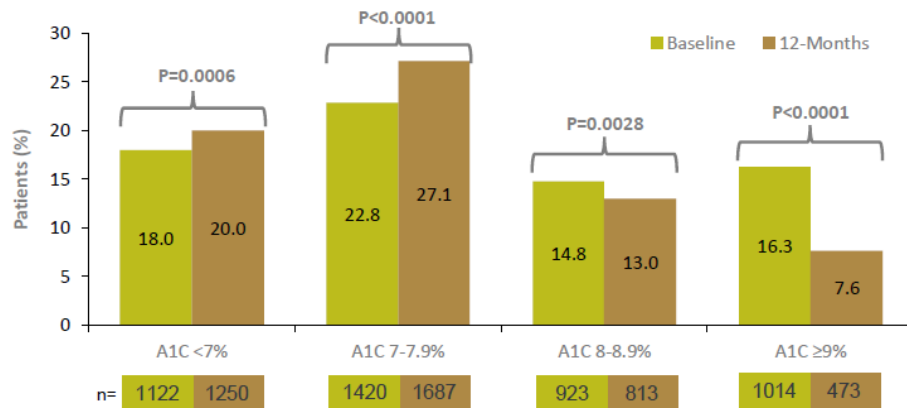
Parameter	Metro cities (n =2378)	Non-metro cities (n=3858)
	Mean (SD) years	Mean (SD) years
Age at recruitment	52.4 (9.33)	52.0 (9.03)
Age at diagnosis	43.8 (8.08)	43.4 (8.05)
Duration of T2D	8.6 (5.73)	8.6 (5.57)



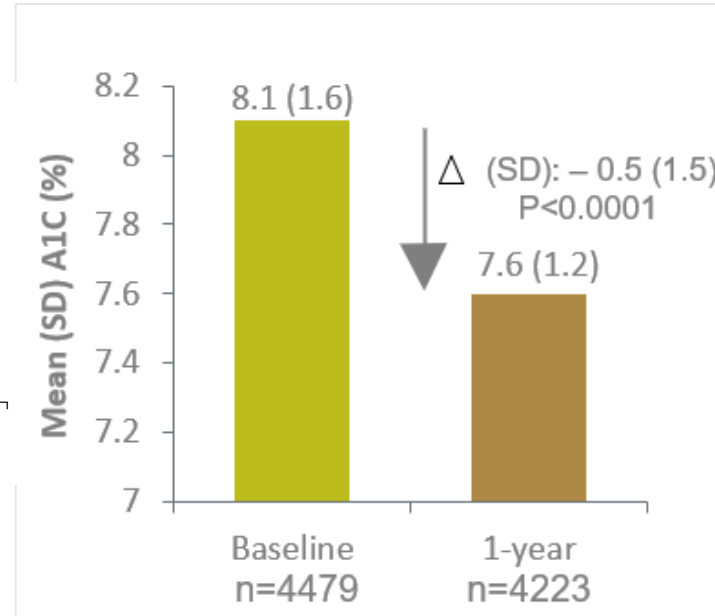
**How did the glycemic status change
after 1-year of observation?**

Glycemic trends at 1-year of observation

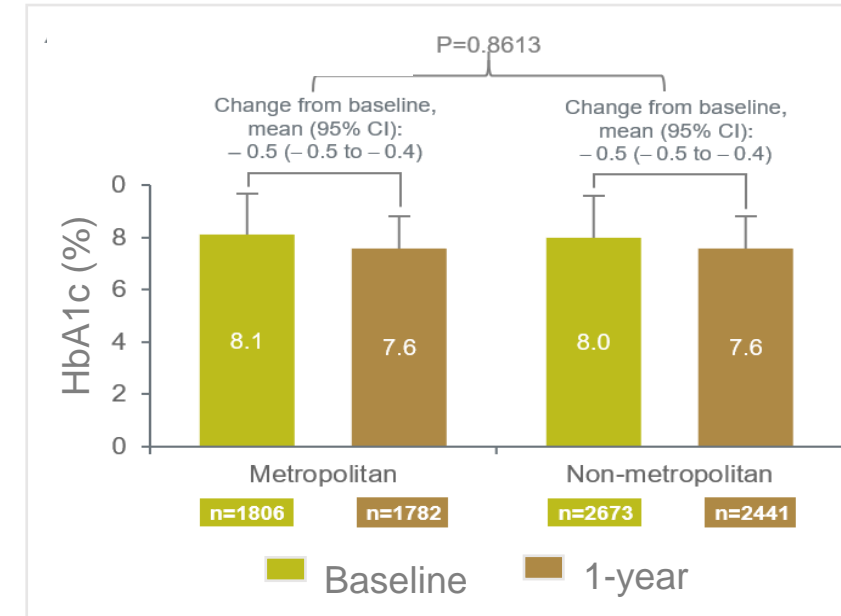
Proportion of patients in different A1C groups at baseline and 1 year



Overall change in A1C



A1C change in metro vs non-metro



- Approximately 20% patients reached optimal glycemic control (A1C <7%) at 1 year follow up.
- From a baseline A1C of 8.1%, there was a fall of 0.5% at 1-year
- At 1-year, participants from both metro & non-metro cities showed improvement in glycemic status



How is the diabetes management evolving over time and which drug classes are becoming more widely used?

Therapy trends at 1-year of observation: Drug classes

- OADs continue to be the main type of treatment in routine practice
- Biguanides and sulfonylureas - most commonly used OADs
- Only 1 out of every 3 type 2 diabetes patient in India is on insulin

Therapeutic categories, n (%)	Baseline (N=6236)	1-year follow-up (N=6013)
Only on OADs	4642 (74.4)	4045 (67.3)
Only on insulin	26 (0.4)	31 (0.5)
On OADs and insulin	1498 (24.0)	1844 (30.7)
On OADs and GLP-1 RA	45 (0.7)	50 (0.8)
On insulin and GLP-1 RA	0	1 (0.0)
On OADs and insulin and GLP-1 RA	25 (0.4)	42 (0.7)
Types of OADs		
Biguanides	5796 (92.9)	5620 (93.5)
Sulfonylureas	4758 (76.3)	4721 (78.5)
DPP-4 inhibitors	3047 (48.9)	3529 (58.7)
Alpha-glucosidase inhibitors	1161 (18.6)	1452 (24.1)
Thiazolidinediones	697 (11.2)	853 (14.2)
SGLT-2 inhibitors	654 (10.5)	1013 (16.8)
Meglitinides	59 (0.9)	70 (1.2)
Injectable glucose lowering drugs		
Basal insulin	838 (13.4)	1130 (18.8)
Premix insulin	684 (11.0)	818 (13.6)
Prandial insulin	228 (3.7)	301 (5.0)
GLP-1 RA	70 (1.1)	93 (1.5)

n=number of participants with non-missing results at the visit. DPP-4, dipeptidyl peptidase-4; GLP-1 RA, glucagon-like peptide 1 receptor agonist; OADs, oral antidiabetic drugs; SD, standard deviation; SGLT-2, sodium-glucose cotransporter-2; T2D, type 2 diabetes mellitus.



Although majority of guidelines mention not to go beyond 3 OADs

>10% of participants were on >3 OADs



**Do adding OADs beyond 3 lead to substantial
glycemic reduction in real life practice?**

Therapy trends: OADs

Subgroup	≤3 OADs	>3 OADs
Baseline	7.6	7.9
n	1941	503
1-year	7.3	7.5
n	1898	496
Δ in 1-year*	-0.3	-0.3

Similar change

*p-value is significant for the change from baseline to 1-year
 ** p-values is significant between the treatments of a subgroup

Addition of OADs beyond 3 may not yield additional substantial benefit in glycemic control



What about addition of insulin?

Therapy trends: Insulins

Subgroup	Insulin naïve	Insulin	Basal	Premix
Baseline	7.7	8.7	8.7	8.7
n	3027	1036	369	387
1-year	7.4	8.1	8.0	8.1
n	2875	997	372	353
Δ in 1-year*	-0.3	-0.7**	-0.9	-0.6

*p-value is significant for the change from baseline to 1-year

** p-values is significant between the treatments of a subgroup

- Glycemic improvement was more evident in the insulin subgroup vs. insulin naïve subgroup
- Use of basal insulin and premix insulin was associated with glycemic improvement



Which CV risk factor is most reported in T2D?

Which diabetes complications are most reported in real life practice?

Amongst urban settings is there a difference in complications between metro and non-metro cities?

Cardiovascular risks

Risk	Total no. of patients with risk reported atleast once	
	n	%
Hypertension	2622	42.05%
Dyslipidemia	1695	27.18%
Albuminuria	160	2.57%

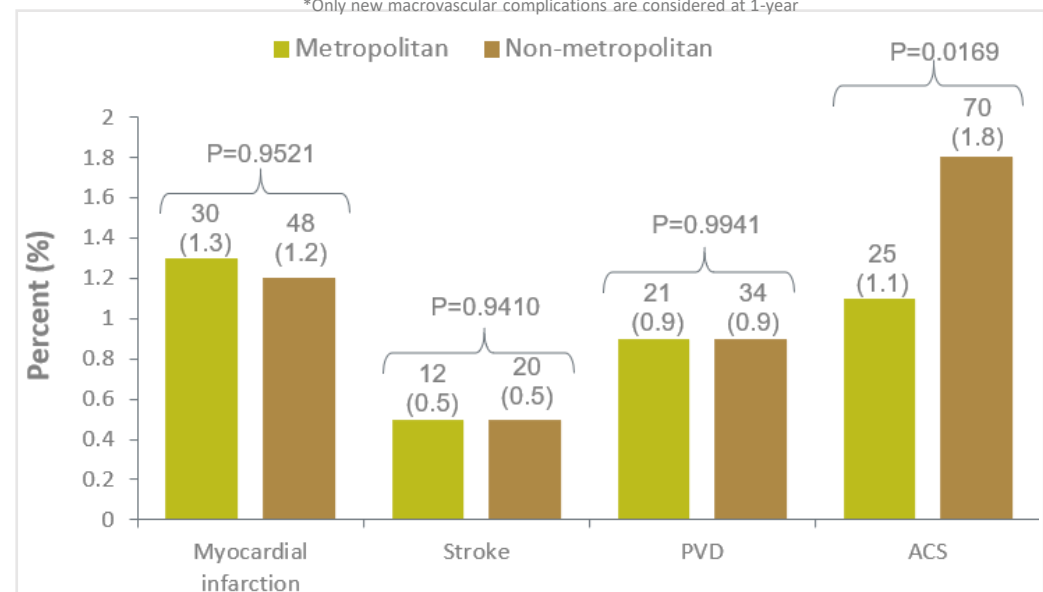
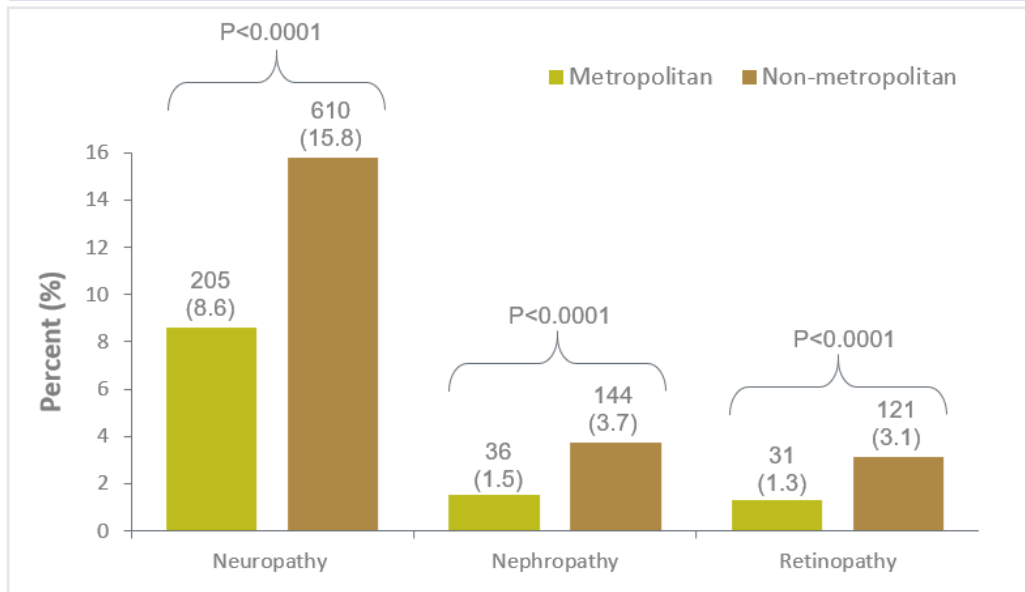
Hypertension is the most reported CV risk factor in T2D

% is calculated on the basis of no. of eligible subjects at baseline N=6236

Complications (1/2)

Microvascular complications	Baseline	1-year
	N=6236	
Neuropathy	737 (11.8)	815 (13.1)
Nephropathy	154 (2.5)	180 (2.9)
Retinopathy	141 (2.3)	152 (2.4)

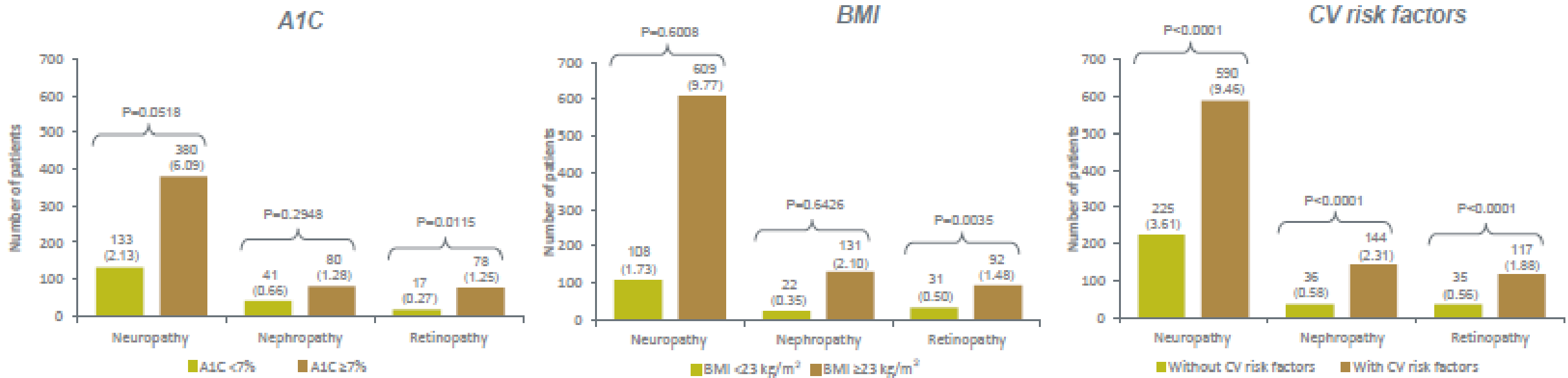
Macrovascular complications*	Baseline	1-year
	N=6236	
Acute coronary syndrome	92 (1.5)	3 (0.0)
Myocardial infarction	74 (1.2)	4 (0.1)
Peripheral vascular disease	45 (0.7)	11 (0.2)
Stroke	30 (0.5)	2 (0.0)



- Participants from non-metro cities may have higher microvascular complications vs metro cities.
- Neuropathy is the most common diabetes complication in both metro and non-metro cities.


Complications (2/2)


Microvascular Complications




- Microvascular complications incidence rates are higher in T2D patients with uncontrolled glycemia, overweight / obesity and CV risk factors
- Presence of CV risk factors significantly raises risk of T2D related microvascular complications

Summary

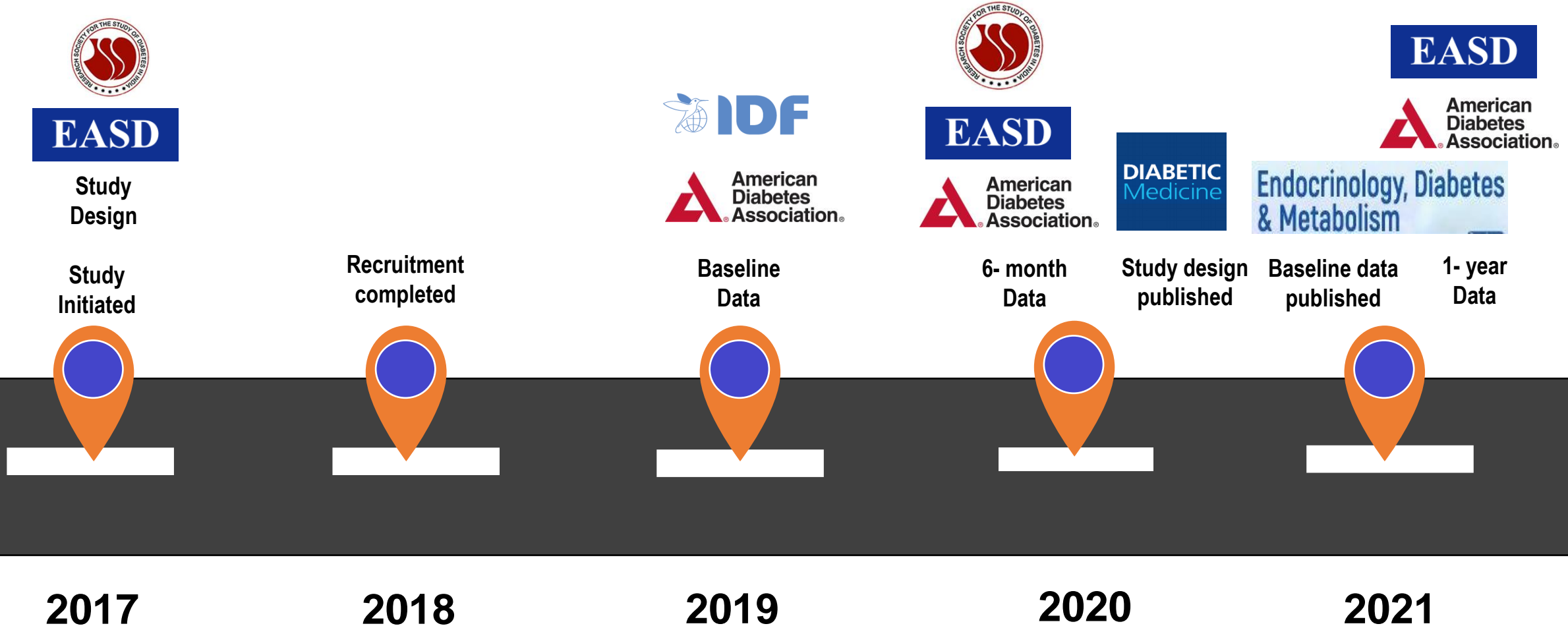
- 
- LANDMARC is the first of its kind prospective, longitudinal, real-world study being conducted nationwide
 - Average age of diagnosis of T2D is 43 years
 - 80% are overweight or obese

- 
- There was an average fall of 0.5% from a baseline A1C of 8.1% at 1-year
 - Biguanides and SUs were common OADs used and insulin uptake is seen in only 1 out of 3 T2D patients
 - Basal analog & human premix were the common injectables used

- 
- No additional benefit of adding more than 3 OADs
 - Neuropathy was the most reported complication
 - Presence of CV risk factors significantly raises risk of T2D related microvascular complications

Landmarks of LANDMARC

Data on study milestones presented at all major congresses



The logo for LANDMARC features the word "LANDMARC" in a bold, orange, sans-serif font. The letter "M" is replaced by a stylized orange location pin icon with a blue circular center. The background is white with decorative orange and blue curved shapes at the top and bottom.

LANDMARC

A Longitudinal Nationwide study on Management
And Real-world outcomes of Diabetes in India

Brought to you by



SANOFI

Sanofi India Ltd., Sanofi House, CT Survey No 117-B, L&T Business
Park, Saki Vihar Road, Powai, Mumbai 400072