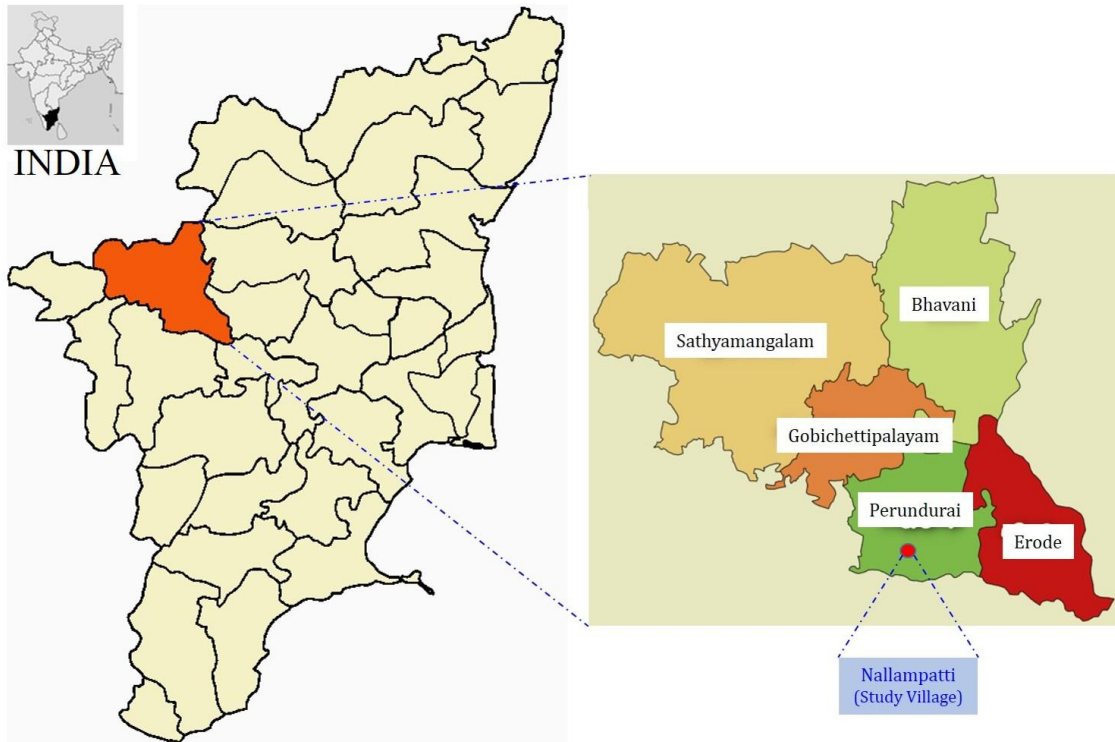


Nallampatti – Noncommunicable Disease Study



Supplementary figure 1: Geographic location of the study village - Nallampatti. The red dot indicates the study village. (Latitude: 11°21'2.39" N; Longitude: 77°32'4.79" E).

Supplementary Table 1: Characteristics of the participants of Nallampatti non-communicable disease-I study – 2015 (NNCD-I, 2015).

KMCH-NNCD, 2015		Whole Population (n=865)	Pre-diabetes (n=371)	Diabetes (n=142)	Carotid Atherosclerosis (n=90)
		Percent	Percent	Percent	Percent
Sex	Male	48.0	43.1	59.6	67.5
	Female	52.0	56.9	40.4	32.5
Age (years)	20 - 40	32.9	25.3	5.7	2.3
	41 - 60	46.6	53.7	57.4	46.1
	Above 60	20.5	21.0	36.9	51.7
Alcohol intake (only Males)	Daily	2.7	2.0	3.8	1.8
	Occasionally	50.4	47.3	58.2	64.9
	Never	47.0	50.7	38.0	33.3
Smoking (only Males)	Daily	31.2	20.5	32.8	35.7
	Occasionally	25.0	14.0	30.3	34.0
	Never	43.8	55.5	36.8	30.3
Tobacco Use	Daily	14.2	17.5	16.2	12.2
	Occasionally	11.5	11.0	8.5	20.8
	Never	74.3	71.5	75.4	67.1
BMI (kg/m²)	Obese (≥ 25)	31.6	34.2	36.2	32.6
	Underweight (≤ 18.5)	13.2	11.2	6.4	18
HbA1c (%)	Diabetes (≥ 6.5)	16.2	--	--	32.6
	Prediabetes (5.7-6.4)	43.4	--	--	48.4
Blood Pressure (mm Hg)	Hypertension ($\geq 140/90$)	37.8	33.0	49.6	54.0
Total Cholesterol (mg/dL)	Hypercholesterolemia (≥ 200)	33.4	40.4	34.6	39.4
CIMT (mm)	Atherosclerosis (≥ 1)	10.3	11.6	20.5	--

Supplementary Table 2: Multiple regression analysis between traditional risk factors and disease outcomes

	Univariate analysis			Multivariate analysis*		
	Risk ratio	95% C.I	P value	Risk ratio	95% C.I	P value
Pre diabetes						
Age	1.05	1.03 - 1.06	<0.001	1.05	1.03 - 1.06	<0.001
Sex	1.19	0.88 - 1.60	0.254	1.29	0.92 - 1.81	0.146
BMI	1.07	1.04 - 1.16	<0.001	1.08	1.02 - 1.17	0.009
Waist Circumference	1.03	1.01 - 1.05	<0.001	0.99	0.97 - 1.03	0.960
Education	1.82	1.29 - 2.58	0.001	1.15	0.77 - 1.74	0.493
Diabetes						
Age	1.10	1.08 - 1.12	<0.001	1.10	1.07 - 1.12	<0.001
Sex	0.64	0.43 - 0.95	0.026	0.80	0.49 - 1.29	0.368
BMI	1.10	1.05 - 1.16	<0.001	1.16	1.06 - 1.27	0.002
Waist Circumference	1.05	1.03 - 1.07	<0.001	0.99	0.96 - 1.04	0.850
Education	2.04	1.32 - 3.16	0.001	1.05	0.61 - 1.80	0.863
Carotid Atherosclerosis						
Age	1.09	1.07 -1.12	<0.001	1.08	1.06 -1.11	<0.001
Sex (Male)	0.41	0.26 -0.66	<0.001	0.49	0.23 -1.05	0.067
BMI	1.01	0.96 -1.06	0.706	1.02	0.91 -1.13	0.782
Waist Circumference	1.03	1.00 -1.05	0.020	1.01	0.96-1.06	0.657
Education	2.07	1.32 -3.25	0.002	1.47	0.82 -2.63	0.198
Pre-diabetes	1.86	1.05 -3.28	0.033	1.10	0.58 -2.08	0.764
Diabetes	3.29	1.96 -5.54	<0.001	1.37	0.76 -2.48	0.297
Hypertension	2.67	1.71 -4.16	<0.001	1.39	0.83 -2.29	0.205
Smoking	2.71	1.72 -4.30	<0.001	1.43	0.73 -2.79	0.297
Total Cholesterol	1.00	0.99 -1.01	0.202	1.39	0.94 -1.01	0.223
Triglyceride	1.00	0.99 -1.00	0.352	1.00	0.99 -1.01	0.134
LDL Cholesterol	1.01	0.99 -1.01	0.119	1.03	0.99 -1.07	0.112
HDL Cholesterol	0.98	0.96 -1.00	0.116	1.01	0.97 -1.06	0.501
Non-HDL cholesterol	1.03	0.94 - 1.00	0.183	1.22	0.88- 1.01	0.232

Multivariate adjustment included age, sex, education, occupation, waist circumference, BMI, diastolic and systolic blood pressure, LDL-cholesterol, familial diabetic history, smoking, alcohol and tobacco usage. p-value showed in boldness indicates the statistical significance.

Supplementary table 3: Average value of different urinary metals among the whole population, diabetic, pre-diabetic, non-diabetic, atherosclerosis and non-atherosclerosis population.

	Range of Metals in Urine ($\mu\text{g}/\text{mg}$ creatinine)			
	Quartile I	Quartile II	Quartile III	Quartile IV
Cadmium	0.03 - 0.04	0.04 - 1.68	1.69 - 4.53	>13.89
Arsenic	1.44 - 18.91	18.92 - 39.78	39.79 - 82.2	≥ 82.3
Lead	0.12 - 39.43	39.44 - 86.27	86.28 - 200.97	≥ 200.98
Chromium	2.65 - 14.35	14.36 - 28.19	28.20 - 52.07	≥ 52.08
Aluminium	0.04 - 118.23	118.24 - 319.13	319.14 - 868.25	≥ 868.26
Zinc	107.72 - 890.00	891.10 - 1477.56	1477.57 - 2538.39	≥ 2538.40
Copper	0.60 - 25.41	25.42 - 52.07	52.08 - 118.47	≥ 118.48
Nickel	2.72 - 19.40	19.41 - 39.28	39.29 - 78.92	≥ 78.93

Supplementary Table 4: The range of heavy metals used for categorization of quartiles.

Metal	Mean ± SE of Metals (µg/ mg creatinine)					
	Whole Population	Non-diabetes	Pre-diabetes	Diabetes	Non-atherosclerosis	Atherosclerosis
	Mean ± SE	Mean ± SE	Mean ± SE	Mean ± SE	Mean ± SE	Mean ± SE
Cadmium	22.8 ± 2.4	22.2 ± 4.0	19.0 ± 2.3	33.5 ± 9.2	20.1 ± 2.1	46.0 ± 13.9
Arsenic	97.5 ± 7.9	74.7 ± 7.2	109.9 ± 12.9	99.8 ± 16.1	88.9 ± 7.9	170.7 ± 31.0
Lead	220.4 ± 36.1	175.0 ± 18.9	262.2 ± 81.7	214.3 ± 30.4	214.9 ± 40.0	267.1 ± 49.1
Chromium	43.6 ± 1.9	42.2 ± 3.9	41.5 ± 2.0	52.6 ± 4.8	42.7 ± 2.0	50.9 ± 5.9
Aluminium	846.8 ± 57.4	790.6 ± 98.3	883.0 ± 87.5	903.8 ± 118.5	794.4 ± 57.0	1294 ± 248.5
Zinc	2249 ± 96.7	1955 ± 124.6	2257 ± 158.5	2930 ± 282.6	2188 ± 99.2	2761 ± 362.9
Copper	121.6 ± 9.5	122.9 ± 19.2	115.1 ± 10.2	137.9 ± 21.6	121.2 ± 10.3	124.7 ± 22.3
Nickel	79.7 ± 7.6	76.7 ± 13.4	82.8 ± 12.4	79.5 ± 21.6	81.0 ± 8.4	68.8 ± 10.4