



POLICY BRIEF

Cardiovascular-Renal-Metabolic (CRM) syndrome in Malaysia: The need for co-screening in community settings

By Murallitharan M., Sara Manzoor, Leevyadhashiny Ganasan, Nur Nadiyah Bakar, Sathiyavani Subramaniam, Yanasha Ramalingam, Mohd Fadzrel Abu Bakar, Jason Chin Yu Aun, Mandy Thoo, Chan Wan Thung, Thaarenee Wiswannadan, Kavinash Loganathan, Saunthari Somasundaram

In collaboration with:



Executive summary

Cardiovascular-renal-metabolic (CRM) syndrome, a systemic disorder underlying heart, kidney and metabolic health, presents a significant health burden in Malaysia. However, current screening and care pathways remain fragmented and disease-specific. This results in missed opportunities to detect overlapping risks early, particularly among underserved populations.

Evidence from the NCSM-Boehringer Ingelheim Saring@Komuniti programme, which screened 5,000 individuals in the Klang Valley, revealed a high burden of CRM risk. Among those screened, 4,888 individuals, or 97.8%, had at least one CRM risk factor, while 3,350 individuals, or 67.0%, had three or more CRM risk factors.

These findings highlight the urgent need for integrated co-screening, a practical approach that enables earlier detection of comorbidities, supports more coordinated care, and improves long-term outcomes.

Call to action

The policy brief calls for:

- Scaling integrated co-screening programmes across primary care and community settings
- Embedding standardised CRM risk assessments into routine health checks
- Expanding access through mobile and community-based screening, especially in underserved areas
- Leveraging digital health tools to support prevention, monitoring, and follow-up

In summary, co-screening offers a practical, high-impact solution to shift Malaysia's healthcare approach from fragmented disease management to proactive, holistic, and patient-centred care, enabling earlier detection, better outcomes, and more sustainable health system performance.

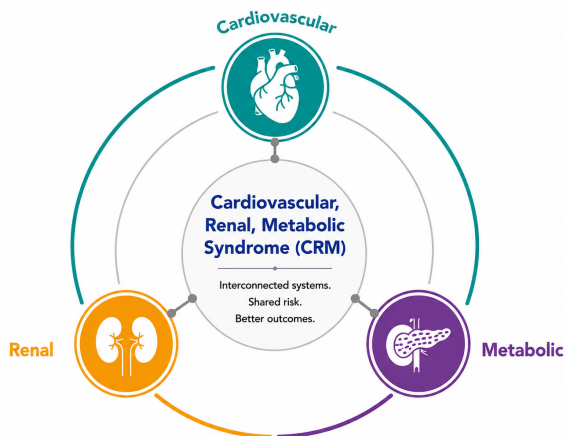


Figure 1: The cardiovascular-renal-metabolic (CRM) syndrome interconnected framework

An introductory view to Cardiovascular-Renal-Metabolic (CRM) syndrome

Approximately two million Malaysians are living with a combination of diabetes, obesity, hypertension, and hyperlipidaemia.¹ The worsening of these diseases can lead to organ failure - particularly of the kidney.^{2,3} In 2024, more than 50,000 people in Malaysia had undergone dialysis or kidney transplantation.⁴

The diseases listed above are closely interlinked, largely preventable, and could be detected, treated, and managed in the early stages.^{2,5,6} However, in many settings, they are approached independently of each other - and only managed together when they become severe - resulting in complications including premature mortality.^{5,6,7}

Emerging evidence shows that treating and managing these interconnected conditions together and early - even during pre-diabetes or pre-hypertension - can improve individual outcomes significantly.^{6,8,9} Detecting them early is key.^{2,6,7} This integrated and holistic approach, increasingly practiced worldwide, addresses the combined burden as the Cardiovascular-Renal-Metabolic (CRM) syndrome.^{7,10}

CRM syndrome, a systemic disorder, results from the interaction between metabolic risk factors such as obesity, Type 2 diabetes, hyperlipidaemia in tandem with cardiovascular and kidney dysfunction. Each of these risk factors is caused by a combination of genetic, behavioural, physiological, and environmental factors, which - when occur together - worsen the effects of each individual disease and hasten the development of complications and even death.^{5,7,10}

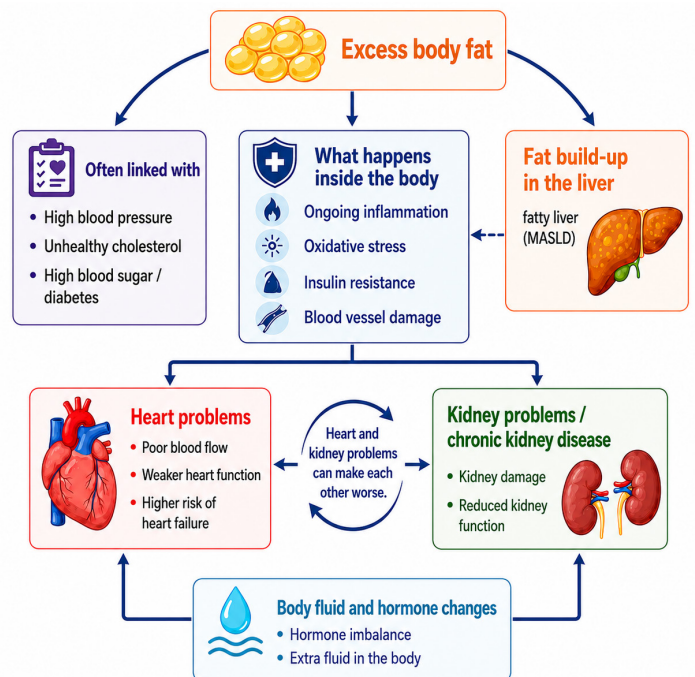


Figure 2: Mechanism of action in cardiovascular-renal-metabolic (CRM) syndrome

CRM syndrome can be categorised into the following stages¹¹:

Stage 0	Individuals without CRM risk factors
Stage 1	Excess or dysfunctional adiposity, defined as i) BMI ≥ 25 kg/m ² OR BMI ≥ 23 kg/m ² in Asian ancestry ii) Waist circumference ≥ 80 cm in women or ≥ 90 cm in men AND iii) Presence of impaired glucose tolerance or prediabetes.
Stage 2	Chronic kidney disease (CKD) AND metabolic risk factors, as determined by the presence of: i) hypertriglyceridemia (≥ 1.5 mmol/L), OR ii) hypertension, OR iii) metabolic syndrome, OR iv) diabetes
Stage 3	Individuals with CRM syndrome AND subclinical cardiovascular disease (CVD)
Stage 4	Clinical CVD such as the following: i) coronary heart disease, ii) heart failure, iii) stroke, iv) peripheral heart disease, v) heart failure, vi) stroke, vii) peripheral artery disease, and viii) atrialfibrillation with OR without kidney failure

Recognising connections between CRM syndrome is critical to prevention and early detection. Apart from preventing pre-mortality, managing CRM syndrome well can vastly improve a patient's quality of life.

Co-screening for Cardiovascular-Renal-Metabolic (CRM) syndrome

Co-screening (also referred to as co-testing) for CRM syndrome is an integrated screening strategy that enables multiple diagnostic assessments to be conducted simultaneously—either using a single patient sample or within the same clinical encounter.^{7,10} This unified approach facilitates the concurrent detection of interconnected conditions, including risk factors such as obesity, and diseases such as diabetes, chronic kidney disease, and cardiovascular disease, reflecting their shared risk factors and pathophysiological linkages.^{7,10}

Why co-screening matters for CRM syndrome?

CRM syndrome risk factors are deeply interconnected (e.g., poor kidney function strains the heart, and insulin resistance damages the kidneys). Instead of evaluating your heart, kidneys, and metabolic system separately, co-screening looks at your overall CRM health.^{7,10}

By testing for them together and identifying the early stages of disease, healthcare providers can use interventions and medications that treat multiple conditions at once, slowing down disease progression and extending life.^{7,10}

Essential co-screening components for CRM syndrome















<p>1 Adiposity / anthropometric measures</p>  <p>Body mass index (BMI)</p> <ul style="list-style-type: none"> • 23.0–27.4 kg/m²: Overweight • ≥ 27.5 kg/m²: Obesity  <p>Waist circumference</p> <ul style="list-style-type: none"> • Men ≥ 90 cm and Women ≥ 80 cm: Central obesity 	<p>2 Blood pressure profile</p>  <p>Blood pressure</p> <ul style="list-style-type: none"> • SBP ≥ 130 mmHg and/or DBP ≥ 85 mmHg: At risk blood pressure 	<p>3 Glycaemic control</p>  <p>HbA1c</p> <ul style="list-style-type: none"> • 5.7%–6.4%: Prediabetes range • $\geq 6.5\%$: Diabetes range  <p>Fasting plasma glucose (FPG)</p> <ul style="list-style-type: none"> • ≥ 5.6 mmol/L: Raised fasting glucose; one criterion for metabolic syndrome • 6.1–6.9 mmol/L: Impaired fasting glucose / Prediabetes range • ≥ 7.0 mmol/L: Diabetes range
<p>4 Lipid profile</p>  <p>Triglycerides (TG)</p> <ul style="list-style-type: none"> • ≥ 1.7 mmol/L: Elevated triglycerides  <p>HDL cholesterol</p> <ul style="list-style-type: none"> • Men < 1.0 mmol/L: Low HDL cholesterol • Women < 1.3 mmol/L: Low HDL cholesterol 	<p>5 Renal function</p>  <p>Estimated glomerular filtration rate (eGFR)</p> <ul style="list-style-type: none"> • < 90 mL/min/1.73m²: Reduced kidney function  <p>Urine albumin–creatinine ratio (UACR)</p> <ul style="list-style-type: none"> • ≥ 3 mg/mmol or ≥ 30 mg/g: Albuminuria 	<p>6 Liver function test / metabolic liver risk</p>  <p>Total bilirubin</p> <ul style="list-style-type: none"> • Above laboratory reference range  <p>Aspartate aminotransferase (AST)</p> <ul style="list-style-type: none"> • Above laboratory reference range  <p>Alanine aminotransferase (ALT)</p> <ul style="list-style-type: none"> • Above laboratory reference range  <p>Gamma–glutamyl transferase (GGT)</p> <ul style="list-style-type: none"> • Above laboratory reference range  <p>Alkaline phosphatase (ALP)</p> <ul style="list-style-type: none"> • Above laboratory reference range

Figure 3: Co-screening for CRM syndrome^{7,10,11}

The issue: Challenges in co-screening in Malaysia

- Fragmented screening and diagnostic practices
 - Existing healthcare protocols often treat CVD, CKD, and metabolic diseases independently rather than as an integrated syndrome (CRM framework), leading to missed opportunities for early identification of overlapping risks.
 - Routine markers for kidney health, notably urinary albumin-to-creatinine ratio (UACR) and estimated glomerular filtration rate (eGFR), are underutilised, meaning early-stage kidney dysfunction is frequently overlooked.
 - Screening focus is largely on diabetes and hypertension, leaving other risk factors or combined pathologies insufficiently addressed.
- Limited public awareness about the interconnected nature of these diseases and the importance of simultaneous screening
 - Many Malaysians remain unaware that conditions such as diabetes, hypertension, and chronic kidney disease are closely linked and often coexist, forming a syndrome that requires holistic management. Public health campaigns in the country often focus on individual diseases rather than promoting the broader concept of CRM syndrome.
 - As a result, there is low participation in co-screening programmes, which delays the diagnosis of comorbid conditions. This delay can lead to disease progression, poorer health outcomes, and increased healthcare costs, placing a significant burden on both individuals and the healthcare system.
- Accessibility challenges in rural and underserved areas
 - Rural and underserved populations in Malaysia face significant barriers to accessing healthcare services, including co-screening programmes for CRM syndrome. These barriers are multifaceted and include geographic isolation, limited healthcare infrastructure, and socioeconomic factors that hinder access to preventive care.

Why does this matter?

Recognising connections between cardiovascular, renal, and metabolic disorders is critical for improving and empowering prevention, early detection and treatment for everyone.

NCSM-BI Saring@Komuniti

The NCSM-BI Saring@Komuniti project is a collaborative partnership between Boehringer Ingelheim and the National Cancer Society of Malaysia (NCSM) aimed at increasing awareness, screening, and early detection of CRM syndrome.

The initiative integrates CRM syndrome co-screening with NCSM's Cardiovascular-Renal-Metabolic Information Service (CRM-IS) to ensure holistic patient care, increased screening uptake, and improved follow-up rates.

In 2025, the programme screened 5,000 individuals from underserved, low-income populations in urban Klang Valley (covering the states of Selangor and the Federal Territory of Kuala Lumpur); reflecting key at-risk populations for CRM conditions.

Following are some of the insights obtained from the screening programme:

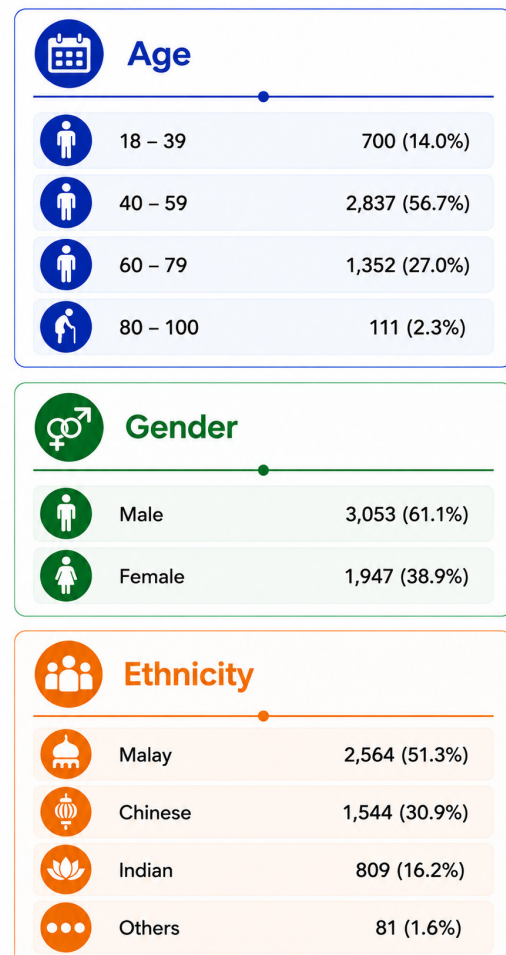


Figure 4: Demographics of attendees to the NCSM-BI Saring@Komuniti programme 2025

The population (N=5,000) was largely middle-aged, with most participants aged 40–59 (56.7%), followed by 60–79 (27.0%). The sample is male-dominant (61.1%) and primarily comprises Malay (51.3%), Chinese (30.9%), and Indian (16.2%) ethnic groups.

1 Adiposity / anthropometric measures			Overall N = 5,000 n (%)
	Body Mass Index	• Obese (BMI ≥ 27.5 kg/m ²)	2,065 (41.3%)
		• Overweight (BMI 23.0 - 27.4 kg/m ²)	1,438 (28.8%)
2 Blood pressure profile			
	Blood Pressure	• Blood Pressure ≥ 130/85 mmHg	905 (18.1%)
3 Glycaemic control			
	HbA1c	• HbA1c 5.7-6.4% (Pre-Diabetes)	1,727 (34.5%)
		• HbA1c ≥ 6.5% (Diabetes)	1,754 (35.1%)
	Fasting Plasma Glucose	• Fasting Plasma Glucose (5.6 - 6.9 mmol/L)	841 (16.8%)
		• Fasting Plasma Glucose (6.1 - 6.9 mmol/L)	670 (13.4%)
		• Diabetes (≥7.0 mmol/L)	438 (8.8%)
4 Lipid profile			
	Triglycerides (TG)	• Triglycerides (≥1.7 mmol/L)	1,240 (24.8%)
	High Density Lipoprotein (HDL)	• HDL cholesterol (<1.0 mmol/L for males) <1.3 mmol/L for females)	1,136 (22.7%)
5 Renal function			
	Estimated Glomerular Filtration Rate (eGFR)	• eGFR (<90 mL/min/1.73m ²)	2,500 (50.0%)
	Urine Albumin-Creatinine Ratio (UACR)	• Urine Albumin - Creatinine Ratio (≥3.0 mg/mmol)	435 (8.7%)
6 Liver function test / metabolic liver risk			
	Total Bilirubin	• Total Bilirubin (>21 µmol/L)	298 (6.0%)
	Aspartate aminotransferase (AST)	• AST (>40 U/L)	338 (6.8%)
	Alanine aminotransferase (ALT)	• ALT (>56 U/L)	128 (2.6%)
	Alkaline phosphatase (ALP)	• ALP (>120 U/L)	344 (6.9%)
	Gamma-glutamyl transferase (GGT)	• GGT (>50 U/L)	256 (5.1%)

Figure 5: CRM syndrome markers of attendees to the NCSM-BI Saring@Komuniti programme 2025

The co-screening results reveal a significant burden of CRM syndrome markers in the screened population.

Insights

Excess adiposity was the most common abnormal finding: 41.3% were obese and 28.8% were overweight, meaning around seven in ten individuals had elevated BMI-related risk.

Glycaemic risk was also very prominent: 34.5% had HbA1c in the pre-diabetes range, while 35.1% had HbA1c in the diabetes range, suggesting a large hidden metabolic burden.

Cardiovascular risk markers were present but lower than adiposity and glycaemia: 18.1% had raised blood pressure, 24.8% had raised triglycerides, and 22.7% had low HDL cholesterol.

Renal abnormalities were notable: 50.0% had eGFR below 90 mL/min, while 8.7% had raised UACR, indicating possible early kidney-risk signals.

Liver enzyme abnormalities were comparatively less frequent, ranging from 2.6% to 6.9%

CRM risk factors often occur together. The more risk factors present, the higher the chance of disease.

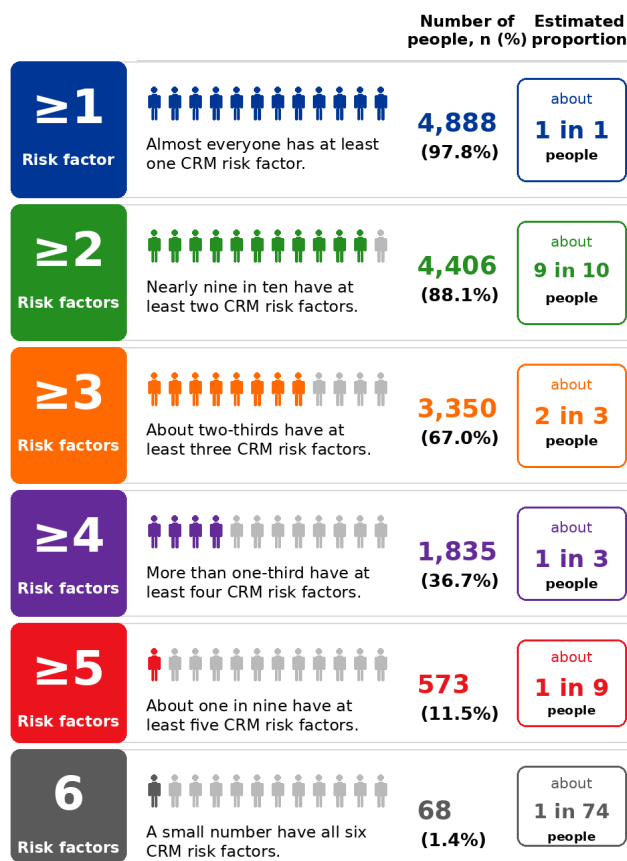


Figure 6: CRM syndrome cumulative risk factors of attendees to the NCSM-BI Saring@Komuniti programme 2025

Insights

Almost all individuals had at least one CRM risk factor: 4,888 out of 5,000 people, or 97.8%, had one or more CRM risk factors.

Risk factor clustering was very common: 4,406 people, or 88.1%, had two or more CRM risk factors, suggesting substantial overlapping cardiovascular, renal, and metabolic risk.

A large high-risk group had three or more risk factors: 3,350 people, or 67.0%, had at least three CRM risk factors.

Severe clustering was also present: 1,835 people, or 36.7%, had four or more CRM risk factors; 573 had five or more; and 68 had all six CRM risk factors.

The data obtained from the CRM diseases NCSM-BI Saring@Komuniti programme 2025 clearly demonstrate that CRM syndrome risk factors rarely occur in isolation. Evidence from local community settings in Malaysia reveal that a substantial portion of individuals carry multiple, interlinked disease burdens, which can accelerate disease progression and worsen outcomes. Importantly, such overlaps are often missed in routine care when conditions are screened separately.

The data therefore reinforces a key policy message: only through integrated co-screening and coordinated management can these hidden comorbidities be detected early and effectively managed, reducing long-term health risks and system costs.

Call to action for co-screening for CRM

Need for comprehensive co-screening programmes

- Adopt and scale integrated co-screening strategies within primary care and community settings. This requires embedding standardised CRM risk assessments into routine health checks, ensuring that possible at-risk individuals are systematically screened for all relevant related conditions.
- Expand nationwide screening efforts to detect and treat high-risk individuals early, particularly those with indicators of CRM syndrome, namely diabetes, hypertension, cardiovascular disease, obesity, chronic kidney disease, and metabolic dysfunction-associated steatotic liver disease (MASLD).
- Co-screening should be incorporated into routine healthcare visits in primary care facilities, and mobile health units in rural areas should be promoted to reach underserved populations.

Public health campaigns

- Leverage digital health technologies (e.g., mobile health apps) to promote healthy lifestyles and track patient progress.

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Appendix

Appendix 1: NCSM-BI Saring@Komuniti 2025 community screening programme

Wilayah Persekutuan Kuala Lumpur

Venue	Attendees
Surau Baitul Mukaram	18
Wisma Buddhist Medical Welfare Centre	66
Wisma MCA	92
PPR Batu Muda	69
Wangsa Walk Mall	144
Perumahan KTMB Lengkuik Abdullah Bangsar	87
Chinese Temple Community Service	83
PPR Hiliran Ampang	53
Kenduri Madani Rakyat	84
The Salvation Army KL	53
Lee Kong China Basketball Court	150
Hari Komuniti PDRM	198
Program Citawarna Kampung Bharu	224
Karnival Sihat Komuniti	107
Dewan Sanggar Pujangga	187
Sri Sathya Sai Baba Centre	260
Persatuan Shenpen Malaysia	98
Gurdwara Tatt Khalsa, Chow Kit	46
KRT Taman Sri Rampai	57
SJKC Tiong Hwa Kok Bin	36
PPR Muhibbah	92
PPR Hang Tuah	41
PPR Sri Langkawi 2	12
KKA Brickfields, KL	54
Dewan Intan Baiduri	69
Dewan Pendekar, Kuala Lumpur	66
KRT Sri Pantai	67
Masjid Segambut Zon	55
KRT Pantai Indah	75
KRT Sg Penchala	31
KRT Taman Bunga Raya	25
SPRM Putrajaya	207
Jalan Duta Community Centre	97

Selangor

Venue	Attendees
BI KOA Hulu Langat	35
Dewan Puchong Batu 14	22
Gasing Indah, Petaling Jaya	37
Kg Dato Mufti Shuib	27
PPR Kampung Baru HICOM	62
Pangsapuri Bukit Puchong	45
SJKT Simpang Utama, Klang	87
St. Mary Church	104
PPR Kampung Limau	39
Kampung Sungai Sekamat Kajang	91
Dewan Jugra	101
PPR Seri Sarawak	58
PPR Beringin Bukit Jalil	82
Selangor Community Centre	39
Bukit Beruntung	77
Bukit Damansara Community Centre	59
Masjid Ammaniah	116
Dewan Komuniti MPKS	62
SJK (C) Bukit Tangga	76
Surau Al Umum	82
Dewan Komuniti Sg Pelek	64
Dewan Komuniti Sekinchan	54
Nasam PJ, Selangor	61
Taman Paramount Basketball Court	75
Dewan Komuniti Pantai Sepang	76
Kapar Klang	78
Masjid Tengku	197
Gugusan Seroja, Kota Damansara	41
Dewan Kompleks Sukan Pandamaran Klang	50

Table 1: Communities screened under the programme

Variable	Overall N=5,000 n (%)
Age	
18 - 39	700 (14.0%)
40 - 59	2,837 (56.7%)
60 - 79	1,352 (27.0%)
80 - 100	111 (2.3%)
Gender	
Male	3,053 (61.1%)
Female	1,947 (38.9%)
Ethnicity	
Malay	2,564 (51.3%)
Chinese	1,544 (30.9%)
Indian	809 (16.2%)
Others	81 (1.6%)

Table 2: Demographics of screened attendees

CRM Syndrome Markers	Overall N=5,000 n (%)
Body Mass Index	
Obese (BMI ≥ 27.5 kg/m ²)	2,065 (41.3%)
Overweight (BMI ~ 23.0 - 27.4 kg/m ²)	1,438 (28.8%)
Blood Pressure Profile	
Blood Pressure $\geq 130/85$ mmHg	905 (18.1%)
Glycemic Control	
Fasting Plasma Glucose	
Fasting Plasma Glucose (5.6 - 6.9 mmol/L)	841 (16.8%)
Fasting Plasma Glucose (6.1 - 6.9 mmol/L)	670 (13.4%)
Diabetes (≥ 7.0 mmol/L)	438 (8.8%)
HbA1c	
HbA1c ~ 5.7 - 6.4% (Pre-Diabetes)	1,727 (34.5%)
HbA1c $\geq 6.5\%$ (Diabetes)	1,754 (35.1%)
Lipid Profile	
Triglycerides (≥ 1.7 mmol/L)	1,240 (24.8%)
High Density Lipoprotein (< 1.0 mmol/L for males < 1.3 mmol/L for females)	1,136 (22.7%)
Renal Function	
eGFR (< 90 mL/min/1.73m ²)	2,500 (50.0%)
Urine Albumin - Creatinine Ratio (≥ 3.0 mg/mmol)	435 (8.7%)
Liver Function	
Total Bilirubin (> 21 μ mol/L)	298 (6.0%)
AST (> 40 U/L)	338 (6.8%)
ALT (> 56 U/L)	128 (2.6%)
ALP (> 120 U/L)	344 (6.9%)
GGT (> 50 U/L)	256 (5.1%)

Table 3: CRM syndrome markers of attendees to the NCSM-BI Saring@Komuniti programme 2025

Number of CRM risk factors	Overall N=5,000 n (%)
No CRM risk factor	112 (2.2%)
1 risk factor only	482 (9.6%)
2 risk factors only	1,046 (20.9%)
3 risk factors only	1,525 (30.5%)
4 risk factors only	1,262 (25.2%)
5 risk factors only	505 (10.1%)
6 risk factors only	68 (1.4%)
Total	5,000 (100%)

Table 4: CRM syndrome risk factors burden among screened attendees of the NCSM-BI Saring@Komuniti programme 2025



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www.cancer.org.my
contact@cancer.org.my

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