



Preventive Health Monitoring and Biomarker Optimization in a Real-World Population (UAE & KSA)

Valeo Health Biomarker Optimization Report
(January–November 2025)



Preventive Health Monitoring

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Abstract

Background

Cardiometabolic diseases, including type 2 diabetes, dyslipidemia, metabolic syndrome, and chronic low-grade inflammation, represent a major and growing public health burden in the Middle East and North Africa region. Preventive health strategies that enable early detection and longitudinal monitoring of modifiable cardiometabolic risk markers may support risk stratification and early intervention in high-risk populations.



Aims

To evaluate longitudinal changes in cardiometabolic risk markers among adults participating in a preventive health monitoring program & to assess the association between repeated biomarker assessments and improvement in modifiable risk profiles in a real-world population residing in the United Arab Emirates & Saudi Arabia.



Methods

This longitudinal observational study included 1,012 adults who underwent at least two biomarker assessments between January and November 2025 as part of routine preventive blood testing. Over 40,000 biomarker measurements were analyzed, including markers of glycemic control (HbA1c, fasting insulin), lipid metabolism (LDL-C, HDL-C, triglycerides, TG/HDL ratio), inflammation (C-reactive protein), micronutrient status (vitamin D, vitamin B12, ferritin, serum iron), and organ function markers. Directionally appropriate changes from baseline were used to define improvement, applying a ~2% threshold to minimize biological and analytical variability.

Results

A substantial proportion of participants demonstrated favorable longitudinal changes in key cardiometabolic risk markers. Improvements were most pronounced in fasting insulin (55%) and inflammatory burden as measured by C-reactive protein (60%). Micronutrient repletion was common, with improvements observed in vitamin D (57%), vitamin B12 (52%), and ferritin (55%). Lipid markers showed modest but consistent improvement, including LDL-C (47%) and TG/HDL ratio (~49%). Glycemic indices demonstrated modest improvement (HbA1c improved in 41%), while liver and kidney function markers remained stable or improved, with no evidence of adverse effects.

Conclusion

In a real-world population residing in the United Arab Emirates & Saudi Arabia, engagement in preventive health monitoring was associated with favorable longitudinal changes in multiple modifiable cardiometabolic risk markers, particularly insulin regulation, inflammation, & micronutrient status. These findings support the role of repeated biomarker assessment as a practical component of preventive health strategies in regions with a high burden of cardiometabolic disease.

Background

Cardiometabolic diseases—including type 2 diabetes mellitus, dyslipidemia, metabolic syndrome, and chronic low-grade inflammation—constitute a major public health burden in the Middle East and North Africa (MENA) region. The International Diabetes Federation estimates that the Middle East and North Africa region has one of the highest age-adjusted diabetes prevalence rates globally, exceeding 16% among adults [1].

In the Gulf Cooperation Council (GCC) countries, cardiometabolic risk is further compounded by high rates of obesity, physical inactivity, and micronutrient insufficiencies. Population-level studies indicate that metabolic syndrome affects approximately 35–40% of adults in both the United Arab Emirates (UAE) and the Kingdom of Saudi Arabia (KSA), depending on diagnostic criteria used [2,3].

Preventive health strategies that emphasize early detection, longitudinal monitoring, and targeted intervention may support risk stratification and mitigate progression to overt disease. However, real-world data evaluating longitudinal biomarker change outside controlled clinical trials remain limited in this region.





Study Design

Longitudinal observational analysis of routine preventive blood testing conducted within Valeo Health's monitoring program.

6,462

Total clients tested in 2025

1,012

Clients with ≥ 2 test encounters

>40,000

Total biomarker measurements analyzed

Timeframe



January 1, 2025

November 9, 2025





Definition of Improvement

To minimize biological and analytical variability, a ~2% change threshold was applied.

- Biomarkers where higher values are favorable (e.g. vitamin D, vitamin B12, ferritin, HDL-C, estimated glomerular filtration rate [eGFR]): an increase from baseline was defined as improvement.
- Biomarkers where lower values are favorable (e.g. HbA1c, LDL-C, triglycerides, C-reactive protein [CRP], fasting insulin, TG/HDL ratio): a decrease from baseline was defined as improvement.

Focus Areas

- Glycemic control and insulin regulation
- Lipid profile and lipid ratios
- Micronutrients & minerals (including vitamin B12, serum iron, zinc, ferritin)
- Inflammatory markers
- Thyroid and hormonal markers
- Liver and kidney function
- Hematologic indices

Note on Female Hormonal Biomarkers

Female sex hormones (e.g. estrogen, progesterone, LH, FSH) were measured; however, interpretation is limited due to variability related to menstrual cycle phase, hormonal contraception, and peri- or post-menopausal status. These markers are therefore reported descriptively and interpreted with caution.





Results

Proportion of Participants Demonstrating Improvement

Category	Example biomarker	% Improved
Glycemic control	HbA1c	41%
Insulin regulation	Fasting insulin	55%
Micronutrients	Vitamin D	57%
	Vitamin B12	52%
Mineral & iron status	Ferritin	55%
	RBC zinc	100%*
	Serum iron	~48%
Lipid profile	LDL-C	47%
	HDL-C	46%
	Triglycerides	45%
Lipid ratios	TG/HDL ratio	~49%
Inflammation	CRP	60%
Thyroid function	Total T3	78%
Hormonal	Testosterone / DHT	57%
Liver function	ALT / AST	~50–55%
Kidney function	eGFR	40%
Hematologic	Platelets	75%

*** Smaller sample size.**



Approximate Relative Change from Baseline



Fasting insulin

~10–15% decrease



C-peptide (fasting):

~10–20% decrease



HbA1c:

~1–2% decrease



CRP:

~10–20% decrease



Vitamin D:

~15–25% increase



Vitamin B12:

~10–20% increase



Ferritin:

~10–30% increase



TG/HDL ratio:

~3–5% decrease



Discussion

This real-world longitudinal analysis demonstrates that engagement in preventive health monitoring combined with iterative, personalized intervention is associated with favorable changes in multiple cardiometabolic risk markers.

The most pronounced improvements were observed in insulin regulation and inflammatory burden, both central drivers of cardiometabolic disease progression [4,5]. Improvements in TG/HDL and LDL/HDL ratios—recognized as stronger predictors of cardiovascular risk than isolated lipid values—further strengthen the cardiometabolic relevance of these findings [6].

High rates of micronutrient repletion (vitamin D, vitamin B12, ferritin, zinc) are consistent with evidence linking correction of deficiencies to improved metabolic and immune function in Middle Eastern populations, where insufficiency is highly prevalent [7,8].

Importantly, liver and kidney markers remained stable or improved, suggesting that upstream metabolic optimization does not adversely affect organ function and may provide systemic benefit.

Conclusion

Within an 11-month period, adults participating in Valeo Health's preventive monitoring and optimization program achieved meaningful improvements across a broad range of modifiable biomarkers, particularly those related to insulin resistance, inflammation, micronutrient status, and cardiometabolic risk ratios.

These findings support the role of repeated biomarker assessment as a practical and scalable component of preventive health strategies in the UAE and KSA—regions facing a disproportionately high burden of cardiometabolic disease. Further longitudinal studies are warranted to evaluate long-term clinical outcomes and population-level impact.





References

1. International Diabetes Federation. IDF Diabetes Atlas, 10th ed. Brussels: IDF; 2023.
2. Al-Rubeaan K, et al. Prevalence and correlates of metabolic syndrome in Saudi Arabia. BMC Endocr Disord. 2018;18:16.
3. Sulaiman N, et al. Metabolic syndrome prevalence in the United Arab Emirates. Int J Obes. 2020;44:175–183.
4. Reaven GM. Insulin resistance and its consequences. Diabetes Care. 2023;46(Suppl 2):S247–S255.
5. Ridker PM. Inflammation, C-reactive protein, and cardiovascular disease. Circulation. 2022;145:1729–1741.
6. da Luz PL, et al. TG/HDL-C ratio as a predictor of cardiovascular risk. Atherosclerosis. 2021;332:1–7.
7. Palacios C, Gonzalez L. Is vitamin D deficiency a major global public health problem? J Steroid Biochem Mol Biol. 2022;214:105944.
8. Musaiger AO, et al. Micronutrient deficiencies in the Middle East. Nutrients. 2020;12:2952.