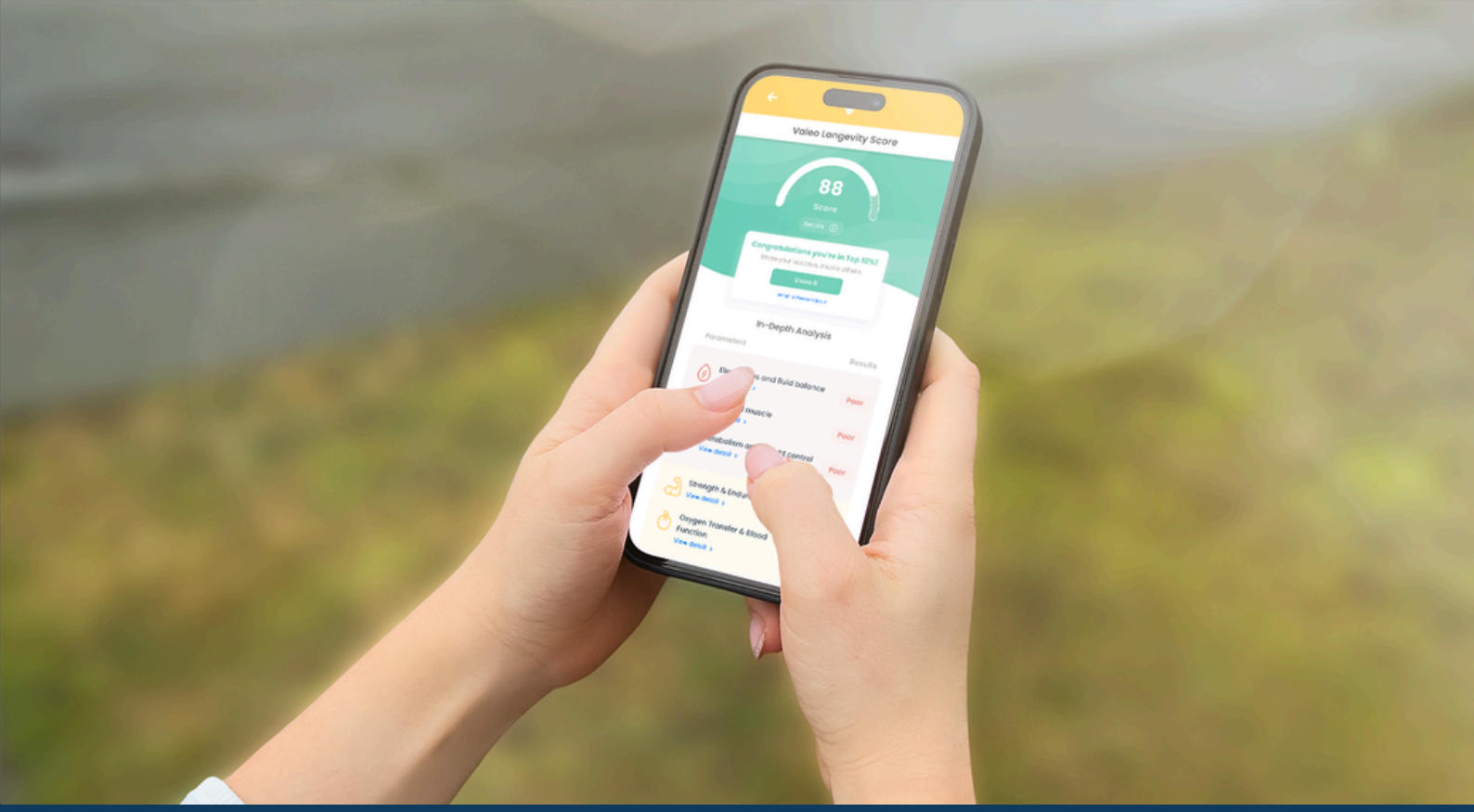


The Longevity Gap:

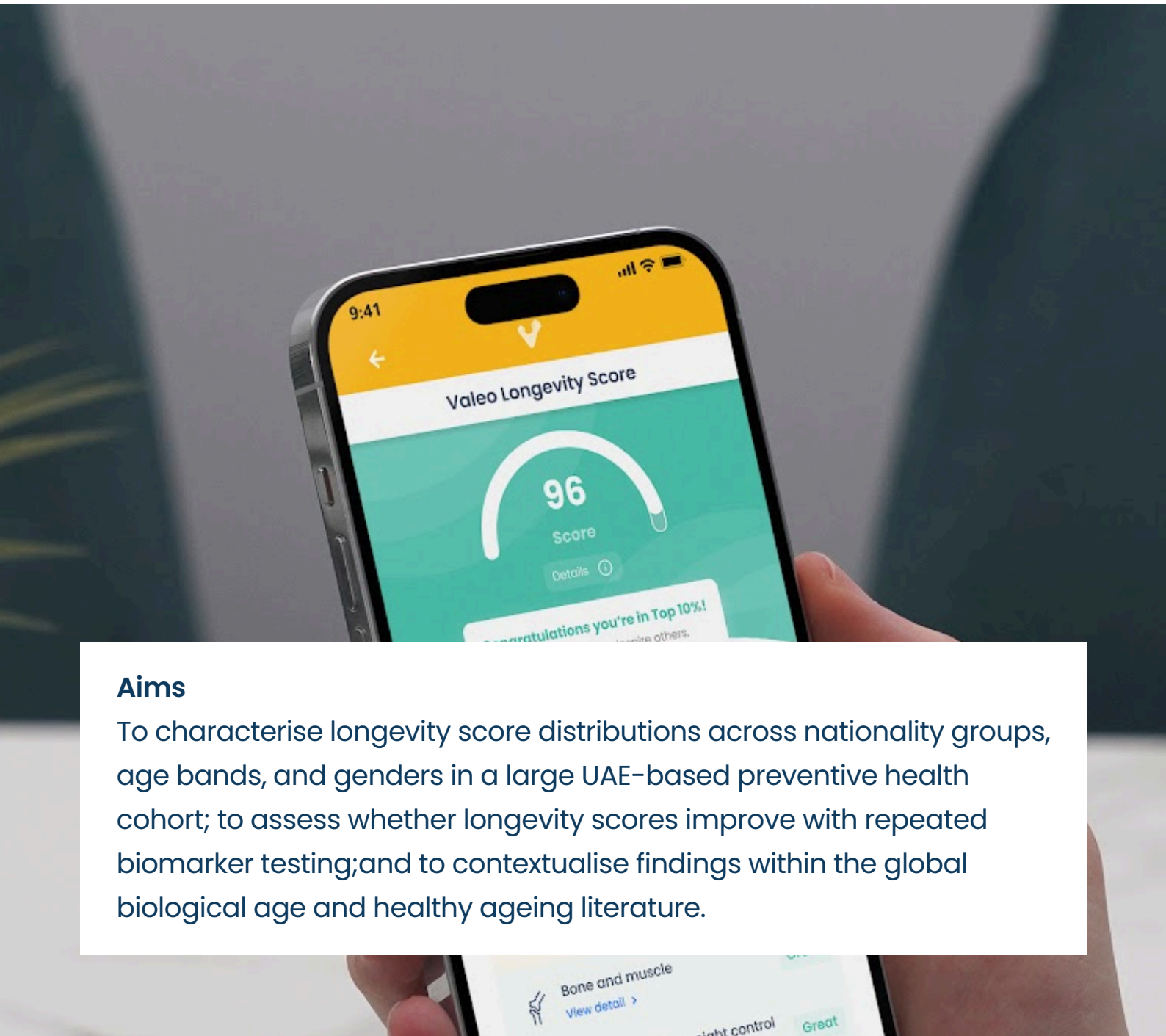
Who Ages Well in the UAE — and Who Doesn't
A Biomarker-Based Longevity Analysis

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Abstract

Background

Biological ageing — the rate at which the body accumulates functional decline independent of chronological age— is increasingly measurable through composite biomarker-based longevity scores. Dubai and the UAE have emerged as global hubs for longevity science and preventive health investment, yet no large-scale, real-world longitudinal longevity score dataset from this region has been published. How nationality, gender, and age interact to shape biological aging trajectories in the UAE's uniquely diverse population remains unknown.



Aims

To characterise longevity score distributions across nationality groups, age bands, and genders in a large UAE-based preventive health cohort; to assess whether longevity scores improve with repeated biomarker testing;and to contextualise findings within the global biological age and healthy ageing literature.

Methods

Retrospective analysis of 7,805 longevity score records from 5,091 unique clients completing the Valeo Health Advanced Blood Test between December 2024 and September 2026. Longevity scores are computed from a proprietary composite of validated biomarkers spanning cardiometabolic, nutritional, inflammatory, hepatic, renal, hormonal, and haematological domains. Descriptive statistics, independent-samples t-tests, one-way ANOVA, Pearson correlations, paired t-tests, and one-sample t-tests were applied. A repeat-tester cohort (n=1,488) was analysed for score trajectory.

Results

The mean longevity score was 83.7 (SD 8.7; median 85.2). Women scored significantly higher than men (84.6 vs 82.7; , $p<0.001$). Scores declined significantly with age ($p<0.001$), with a notable convergence between genders after age 50. Significant between-age-band differences were confirmed by ANOVA ($p=0.0003$). Nationality showed a clinically meaningful 6-point gap (Russian:86.0 vs Indian: 80.0). Among repeat testers, longevity scores improved significantly over time ($p=0.0016$), with a dose-response pattern: clients completing 5 or more tests showed 60% improvement rates and a mean score gain of 1.71–1.90 points. Population-level scores improved from 81.1 (2024) to 84.2 (2026).

Conclusion

Longevity scores in UAE residents vary significantly by gender, age, and nationality. The data supports a dose-response relationship between biomarker monitoring frequency and longevity score improvement. As Dubai positions itself as a global longevity capital, these findings provide the first real-world evidence base for nationality-stratified biological aging risk in the region and highlight the role of structured, repeated testing as a measurable health optimisation tool.

Background

Biological Age vs. Chronological Age

Chronological age counts years lived. Biological age measures how much those years have cost the body. The two do not always align. A 45-year-old with optimised biomarkers, low inflammation, and robust metabolic function may carry a biological profile more consistent with a 35-year-old, while another individual of the same age may present with organ function, hormonal markers, and inflammatory burden typical of someone a decade older. This gap is what longevity science is increasingly equipped to measure, and what this report attempts to quantify at a population level in the UAE.

The concept of biological age has been formalised through multiple methodological frameworks over the past two decades. Horvath's epigenetic clock (2013) established that DNA methylation patterns predict biological age with greater accuracy than any single biomarker (Horvath, 2013). Subsequent work by Levine et al. (2018) developed PhenoAge — a composite of clinical biomarkers including albumin, creatinine, glucose, CRP, lymphocyte percentage... demonstrating that a biomarker composite predicts mortality risk independently of chronological age (Levine et al., 2018). More recently, the work of Johnson et al. (2023) has shown that biological age is modifiable — it can be meaningfully reduced through targeted lifestyle, dietary, and supplementation interventions — establishing the scientific foundation for preventive biological age management (Johnson et al., 2023).



Background

Dubai as a Global Longevity Hub

The UAE's investment in longevity science is among the most ambitious globally. In 2021, the UAE government launched the National Longevity and Wellbeing Strategy 2031, with an explicit goal of positioning the Emirates as a world leader in longevity research and healthy aging infrastructure (UAE Government, 2021). Dubai's D33 Agenda — the emirate's economic blueprint through 2033 — identifies longevity as a pillar industry, alongside healthcare tourism and preventive medicine. Dubai Healthcare City has expanded its longevity clinical capacity, and the Dubai Future Foundation has invested in biological age research as part of its broader healthcare innovation mandate.

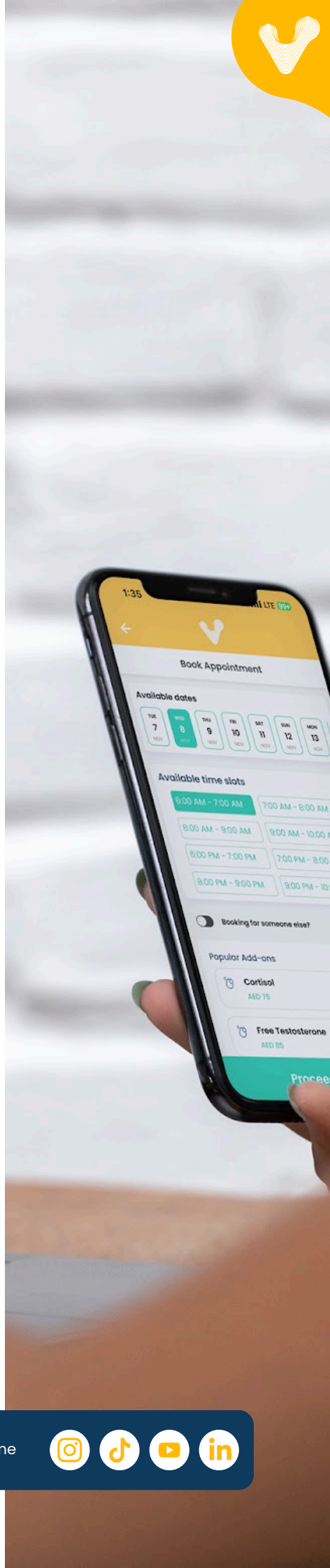
This institutional commitment is being matched by consumer behaviour. Dubai now hosts a growing concentration of preventive health clinics, longevity-focused supplement brands, advanced diagnostics providers, and GLP-1 prescribing centres — a landscape that has emerged almost entirely since 2020. Within this context, Valeo Health's Advanced Blood Test and proprietary longevity scoring system represent one of the most granular and longitudinally rich biomarker datasets available for the UAE population and the only one, to our knowledge, that enables direct comparison of biological aging trajectories across the UAE's diverse nationality groups.



Background

The Gap in GCC Longevity Research

Despite the UAE's institutional investment in longevity, the published research base for biological ageing in the GCC population remains thin. Al-Daghri et al. (2017) documented vitamin D deficiency and metabolic syndrome prevalence across Saudi Arabian cohorts, establishing a nutritional baseline for the region. Nassef et al. (2020) identified metabolic syndrome as a primary driver of premature ageing-related disease in GCC populations. However, no published study has applied a composite biological age score to a large, diverse UAE resident cohort, and none has examined how nationality — a powerful proxy for genetic background, dietary heritage, and lifestyle history — predicts longevity score in a shared urban environment. This report addresses that gap directly.



STUDY METHODOLOGY

Study Design

Retrospective, observational, longitudinal cohort analysis of anonymised real-world biomarker data.

This is a retrospective, observational, longitudinal cohort study of anonymised longevity score data from clients completing the Valeo Health Advanced Blood Test between December 2024 and September 2026. No experimental intervention was applied. All data was de-identified at source. Findings are presented as a hypothesis-generating observational report.

5,091
Unique clients

7,805
Test events

1,488
Repeat testers (2+ tests)

Timeframe

December, 2024 — September, 2026

Methods

The Valeo Longevity Score — How It Is Calculated

The Valeo Health longevity score is a proprietary composite index derived from a panel of validated biomarkers measured through the Advanced Blood Test. The score is calculated fresh at each test event — it is not carried forward or interpolated between tests. It integrates markers across six physiological domains: cardiometabolic, inflammatory, nutritional, hepatic, renal, haematologic, & hormonal. Each biomarker is scored against validated international reference ranges, weighted by its evidence-based contribution to longevity outcomes, and aggregated into a composite score on a 0–100 scale. Higher scores indicate a biomarker profile more consistent with healthy biological ageing. The score is available exclusively for clients completing the Advanced Male or Female Blood Test package; clients on smaller panels are excluded from this analysis.

Statistical Analysis

Mean, median, SD, IQR, minimum, and maximum computed for the full longevity score distribution. Independent-samples two-tailed t-test comparing mean longevity scores between female and male clients. Gender gap quantified within each age band using weighted mean differences. Pearson correlation coefficient computed between age at test and longevity score, stratified by gender. One-way ANOVA applied across age bands to confirm statistical significance of the age gradient.One-way ANOVA applied across nationality groups with sufficient sample size. For clients with 2+ test events: first vs. most recent longevity score extracted per client. Paired two-tailed t-test assessed whether mean score change differed significantly from zero. Cohen's d quantified effect size. Dose-response analysis stratified improvement rates and mean score change by number of tests completed.

Results

3.1 Population Overview and Score Distribution

The study population comprised 5,091 unique clients across 7,805 longevity score test events. The cohort was 55.3% female (n=4,317 tests) and 44.7% male (n=3,488 tests). Age data was available for 7,149 tests (91.6%); nationality data was available for 7,803 tests (99.97%). The study period spans December 2024 to September 2026, capturing 21 months of Advanced Blood Test activity at Valeo Health, Dubai.

Table 1. Longevity score distribution across the full cohort.

Score Band	Range	n (tests)	% of cohort	Clinical interpretation
Very low	<60	77	1.0%	Significant multi-domain biomarker burden — urgent clinical review
Low	60–69	504	6.5%	Elevated risk across multiple physiological domains
Moderate	70–79	1,725	22.1%	Addressable deficiencies present — intervention recommended
Good	80–89	3,451	44.2%	Majority group — healthy range with optimisation opportunities
Excellent	90–100	2,044	26.2%	Optimal biomarker profile — maintaining and monitoring

The mean longevity score was 83.7 (SD 8.7; median 85.2). The distribution was negatively skewed — the median exceeded the mean, indicating a minority of low-scoring clients pulling the average down. 70.5% of clients scored 80 or above, reflecting broadly positive health engagement in this self-selected population. However, 7.4% scored below 70 — a clinically concerning subgroup warranting urgent multi-domain intervention. Four records with scores above 100 (maximum 169.1) were identified as likely data entry errors and excluded from all analyses.

Results

3.2 Year-on-Year Score Improvement

Population-level mean longevity scores improved consistently across the study period: 81.1 in 2024 → 83.4 in 2025 → 84.2 in 2026— a 3.1-point rise over 21 months. This improvement may reflect several converging factors: increasing health awareness and supplement uptake across the UAE population, the growing influence of GLP-1 therapy on metabolic biomarkers (particularly HbA1c and lipids), and a potential learning effect among repeat Valeo clients who act on their results between tests. However, the changing cohort composition across years means this trend should be interpreted as descriptive rather than as evidence of within-individual improvement at the population level.

Table 2. Mean longevity score by calendar year.

Year	n (tests)	Mean Score	Median	SD
2024	120	81.1	81.6	8.8
2025	4,280	83.4	85.0	8.6
2026 (Jan-Sept)	3,405	84.2	85.7	8.7

Results

3.3 Gender Differences in Longevity Scores

Women scored significantly higher than men across the full dataset: Female mean 84.6 (SD 8.6) vs Male mean 82.7 (SD 8.7); $p<0.001$. This 1.9-point gap is statistically robust and clinically meaningful — it represents nearly a quarter of a standard deviation difference in composite biological age profile. Both genders showed a significant negative correlation with chronological age: Female $r=-0.236$ ($p<0.001$), Male $r=-0.221$ ($p<0.001$), confirming that biological age accumulates with chronological age in both sexes independently.

Table 3. Mean longevity score by age band and gender

Age Band	Female score	Male score	Gender gap (F - M)	Clinical note
<30 years	86.5	84.9	+1.5	Highest scores in both genders — youngest cohort
30–39 years	85.6	83.5	+2.1	Female advantage largest in peak productive years
40–49 years	84.4	82.1	+2.3	Gender gap widens — male cardiometabolic burden accumulating
50–59 years	80.4	81.0	-0.7	Gender advantage reverses — female hormonal transition impact
60+ years	81.2	81.2	0.0	Complete convergence — survivor/selection effect likely

Results

3.3 Gender Differences in Longevity Scores

The gender gap narrative is nuanced and clinically significant. Women maintain a clear biological longevity advantage through the 30s and 40s — consistent with the established protective effects of estrogen on cardiovascular, inflammatory, and metabolic pathways (Vitale et al., 2020). However, this advantage reverses at 50–59 and disappears entirely at 60+, a pattern consistent with the accelerated biological ageing that accompanies the menopausal transition in women — the loss of estrogen's cardioprotective and anti-inflammatory effects generating a rapid catch-up in biological age burden (Baber et al., 2016).

3.4 Age and Biological Ageing

One-way ANOVA confirmed statistically significant differences in mean longevity score across age bands (, p=0.0003). The decline is consistent but non-linear, with mean scores falling from 86.5 in clients under 30 to 80.4–81.2 in the 50–60+ range — a decline of approximately 5–6 points over three decades. This rate of decline — roughly 0.17–0.20 points per year — is broadly consistent with published biological ageing rate estimates from European cohort studies, which report biological age accumulation of approximately 1–2 biological years per chronological year in healthy middle-age adults (Belsky et al., 2020).

The 60+ paradox: Clients aged 60+ score marginally higher than clients aged 50–59 (81.2 vs 80.4–81.0). This counter-intuitive finding likely reflects a survivor selection effect — clients aged 60+ who are seeking the Advanced Blood Test at Valeo are an unusually health-motivated, health-literate subgroup. Those with severely compromised biomarkers in this age band are less likely to be seeking preventive testing and more likely to already be in secondary care. This selection bias is a known limitation of direct-to-consumer health data and is consistent with observations from the wider preventive health literature (Topol, 2019).

Results

3.5 Nationality and Longevity Scores — The Passport Gap

Eight nationality groups had sufficient representation in the Advanced Blood Test dataset for meaningful longevity score comparison (minimum n=50 Advanced Test clients). The results reveal a 6-point gap between the highest- and lowest-scoring nationality groups — a clinically and statistically meaningful difference representing approximately 0.7 standard deviations in composite biological age profile.

Table 4. Mean longevity score by nationality group

Nationality	n (clients)	Weighted avg score
Russian	134	86.0
Canadian	74	85.5
American	125	85.4
German	52	84.7
British/UK	1,075	84.5
Lebanese	148	84.3
Emirati	595	82.9
Indian	583	80.0

The ranking is clinically coherent and consistent with the broader literature on nationality-specific health risk. Russian clients score highest at 86.0 — a finding that aligns with observations from Valeo's companion Expat Health Paradox report, where Russian clients also showed the lowest cardiometabolic biomarker burden and the highest retesting engagement rates.

Results

3.5 Nationality and Longevity Scores — The Passport Gap

Emirati clients score 82.9 — below the Western European and Eastern European groups, but above Indian clients. This positioning is consistent with Emirati clients' broader biomarker profile: the highest HbA1c mean of any nationality group (5.87% overall; 9.47% in males) alongside broadly normal lipid and inflammatory markers pulls the composite score downward despite other domains being within range.

Your passport may be predicting your biological age. In the UAE — a city where Russians, Indians, Emiratis, and British nationals work side by side, breathe the same air, and access the same healthcare — a 6-point difference in composite biological age score separates the healthiest and least healthy nationality groups. That gap reflects decades of genetic predisposition, dietary heritage, and health behaviour — compressed into a single number.

3.6 The Retesting Effect — Does Monitoring Your Biology Change It?

Among the 1,488 clients completing two or more Advanced Blood Tests, longevity scores showed a statistically significant improvement from first to most recent test: mean first score 82.97 vs mean latest score 83.59 (p=0.0016). Effect size was small (Cohen's d=0.082), which is expected for a composite score averaged across a clinically heterogeneous population. The median inter-test interval was 184 days (approximately 6 months).

Results

A Dose-Response Relationship Between Testing Frequency and Score Improvement

The most compelling finding in the repeat tester analysis is not the average improvement, but the dose-response pattern by number of tests completed. As testing frequency increases, both the proportion of clients who improve and the magnitude of improvement rise consistently:

Table 5. Longevity score improvement by number of tests completed

Tests completed	n clients	% who improved	Mean score change	Clinical signal
2 tests	942	37.3%	+0.28	Weak — near baseline variation
3-4 tests	398	52.0%	+0.97	Moderate — improvement emerging
5-6 tests	95	60.0%	+1.71	Strong — consistent improvement signal
7+ tests	53	60.4%	+1.90	Strong — sustained and robust

Results

3.6 The Retesting Effect — Does Monitoring Your Biology Change It?

Clients completing 5 or more tests are nearly twice as likely to improve their longevity score as those completing only two tests (60% vs 37%), and show a mean score gain of +1.71 to +1.90 points — approximately 3 times the magnitude of gain seen in two-test clients. Time elapsed between first and last test did not predict improvement (p=0.109), indicating that it is the number of testing touchpoints, not the passage of time, that drives score improvement.
This dose-response pattern is consistent with the behavioural mechanism proposed by Khoury et al. (2016): repeated personalised biomarker feedback activates progressively more targeted health behaviour change, as clients identify specific deficiencies, act on them (through supplementation, coaching, or dietary modification), and return to confirm improvement. Each testing cycle creates an accountability loop that appears to compound over time.

Clients completing exactly two tests show only a 37.3% improvement rate — barely above the 50% coin-flip that would indicate random variation. The meaningful signal only emerges from the third test onward. This suggests that two-test clients may be completing their second test before they have had sufficient time to implement and measure the impact of changes identified in their first results. A recommended minimum retest interval of 90 days and a minimum of 3 tests is implied by the data.

Discussion

4.1 The Longevity Score as a Population Health Tool

The mean longevity score of 83.7 in this cohort places the average Valeo Advanced Blood Test client firmly in the "Good" biological health band — a finding that likely reflects the self-selected nature of the population (health-motivated, higher socioeconomic status, actively seeking preventive monitoring) as much as any intrinsic population characteristic. The more clinically significant finding is the distribution within the cohort: 7.4% of clients scoring below 70 (Low or Very Low) despite having proactively sought testing, and a 6-point gap between the highest- and lowest-scoring nationality groups in a shared urban environment, suggests that longevity score is capturing real and meaningful between-individual and between-group variation — not simply reflecting socioeconomic health literacy uniformly across the population.

4.2 Gender — The Estrogen Advantage and Its Disappearance

The finding that women outscore men by 1.9 points on average ($p<0.001$), with the gap widening to 2.3 points in the 40–49 age band before converging entirely at 60+, is consistent with the established biology of sex hormones and ageing. Estrogen exerts anti-inflammatory, cardioprotective, and metabolic-protective effects that are well-characterised in the literature (Vitale et al., 2020). Its withdrawal at menopause accelerates multiple biological ageing mechanisms simultaneously — increasing LDL, reducing HDL, elevating inflammatory markers, and reducing bone density — producing a rapid narrowing of the gender longevity gap that is precisely what this dataset captures at the population level.

Discussion

4.2 Gender — The Estrogen Advantage and Its Disappearance

The clinical implication for Valeo is direct: perimenopause is the highest-impact inflection point in female biological ageing and represents the window where biomarker-based intervention has the greatest potential to preserve longevity score. The data supports positioning structured hormonal and nutritional monitoring — including thyroid function, iron stores, vitamin D, and inflammatory markers — as a standard clinical pathway for female clients entering the 45–55 age window.lation.

4.3 Nationality — Genetics, Lifestyle, and the 6-Point Passport Gap

The 6-point longevity score gap between Russian (86.0) and Indian (80.0) clients is not a random finding — it replicates, in a biological age composite format, the well-established South Asian atherogenic phenotype (Bhopal, 2013). Indian clients bring a genetic predisposition to lower HDL, higher triglycerides, greater insulin resistance, and earlier cardiovascular disease onset that is independent of BMI and lifestyle — and which, in the UAE's high-carbohydrate, low-activity urban environment, is compounded rather than mitigated. The longevity score — by aggregating across lipid, inflammatory, glycaemic, and nutritional domains —captures this multi-system disadvantage as a single number for the first time in a UAE clinical dataset.

The Lebanese client mean of 84.3 — among the higher-scoring groups and above the Emirati mean — is consistent with the Mediterranean dietary heritage of Lebanese populations: high olive oil consumption, plant-forward dietary patterns, and moderate fish intake all contribute to lower inflammatory burden and better lipid profiles. This finding aligns with the extensive Mediterranean diet longevity literature (Sofi et al., 2014) and suggests that dietary origin is a meaningful component of the nationality longevity signal, not purely genetics.

Discussion

4.4 The Retesting Effect — Correlation, Causation, and What We Can Claim

The statistically significant improvement in longevity scores among repeat testers (p=0.0016) and the dose-response relationship between testing frequency and improvement magnitude are the most commercially and clinically actionable findings in this dataset. However, they require careful interpretive framing.

The observational design cannot establish that retesting causes longevity score improvement. Two competing explanations exist: the informed action hypothesis (clients see their results, act on them, and improve), and the healthy engager bias (clients who choose to retest are already more health-motivated and would have improved regardless). Without a randomised control group, these cannot be cleanly separated. What can be stated with confidence is that in five years of data, clients who completed five or more Advanced Blood Tests showed 60% improvement rates and a mean score gain nearly seven times larger than two-test clients — a pattern that is difficult to attribute to chance or selection bias alone.

This finding is consistent with the preventive health monitoring literature. Topol (2019) argued that the single most powerful driver of health behaviour change is personalised data — knowing your own numbers, not population averages. Khoury et al. (2016) demonstrated that biomarker feedback increases supplement uptake, physical activity, and dietary change in healthy adult populations. The dose-response pattern in the Valeo dataset is consistent with this mechanism being activated progressively with each successive testing cycle.

Discussion

4.5 Comparison with Global Longevity Score Literature

Direct comparison with published biological age datasets is limited by methodological heterogeneity — different scoring systems, different biomarker panels, and different population bases make precise numerical comparisons inappropriate. However, several directional comparisons are informative.

The PhenoAge algorithm (Levine et al., 2018), validated in the US NHANES cohort, produces biological age estimates that diverge from chronological age by approximately -3 to +7 years across the adult lifespan, with the greatest divergence (accelerated biological ageing) concentrated in the 40–60 age window — consistent with the steepest score declines observed in this UAE dataset. The Klemera-Doubal biological age method (Klemera & Doubal, 2006), applied across multiple European cohorts, similarly identifies gender as a significant modifier of biological age trajectory, with women showing slower biological ageing than men through midlife — precisely the pattern observed here.

The fact that this UAE dataset, using a proprietary composite, replicates both the age gradient and the gender pattern observed in established biological age methodologies applied to Western populations provides preliminary evidence for the construct validity of the Valeo longevity score — it appears to be measuring something real and consistent with the global literature, even in the absence of a formal validation study.

Conclusions

In the world's most ambitious longevity investment destination, biological age is not equally distributed. This first real-world longevity score analysis from Dubai reveals that nationality, gender, and testing frequency all meaningfully predict a person's composite biological age profile — in ways that are consistent with, and extend, the global biological age literature.

Finding 1
Women outscore men by 1.9 points overall ($p<0.001$), with the gap peaking at 2.3 points in the 40–49 band. At 60+, the gap closes entirely — a biological signature of the menopausal transition visible at population scale.

Finding 2
A 6-point longevity score gap separates Russian (86.0) and Indian (80.0) clients in the same city — replicating the South Asian atherogenic phenotype in a biological age composite forthe first time in the UAE.

Finding 3
Repeat testers show statistically significant score improvement, ($p=0.0016$), with a clear dose-response: 5+ tests= 60% improvement rate and +1.90 mean gain vs. 37% and+0.28 for two-test clients.

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