Sample Underwriting Manual

Life & Health Insurance Underwriting Using Apple HealthKit Data

Disclaimer: This is a *sample / illustrative* underwriting manual for conceptual, internal design, or pilot purposes only. It is **not** actuarial advice, medical advice, or a regulatory-approved underwriting framework. Any real-world use requires actuarial validation, medical governance, legal review, privacy consent, and regulatory approval.

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1. Purpose & Scope

This manual defines how Apple HealthKit data can be used to:

- Supplement traditional life and health insurance underwriting

- Assign **Underwriting Risk Scores (URS)**

- Map scores to **Risk Classes** and **Rating Actions**

Covered products:

- Term Life

- Permanent Life (simplified)

- Individual Health & Critical Illness

Excluded:

- Guaranteed Issue products

- Group underwriting

- Disability income (future phase)

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2. Underwriting Philosophy

1. **Behavior matters**: Sustained healthy behavior reduces mortality and morbidity risk.

2. **Longitudinal > point-in-time**: Trends over 90–365 days are preferred over snapshots.

3. **Data is additive, not punitive**: HealthKit data can improve or maintain a rating but does not automatically decline applicants.

4. **Explainability first**: All automated decisions must be interpretable.

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3. Applicant Consent & Data Governance

3.1 Consent Requirements

Applicants must explicitly consent to:

- HealthKit data access

- Defined lookback period (default: 12 months)

- Ongoing refresh (optional for dynamic pricing)

3.2 Privacy & Security

- Read-only access to HealthKit

- No raw data stored beyond underwriting window

- Aggregated metrics retained, raw signals discarded

- Fully compliant with HIPAA / PHIPA / GDPR equivalents

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4. HealthKit Data Categories Used

Category	HealthKit Data Type	Use in Underwriting
Activity	Steps, Active Energy	Cardiovascular health proxy
Fitness	VO$_2$ Max	Mortality risk indicator
Vitals	Resting HR, HRV	Cardiac & stress health
Sleep	Duration, consistency	Chronic disease risk
Body Metrics	Weight, BMI trend	Metabolic risk
Mobility	Walking speed, steadiness	Aging & frailty risk
Exercise	Workout frequency/intensity	Lifestyle consistency

Excluded:

- Reproductive health

- Mental health notes

- GPS/location data

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5. Lookback Periods & Data Quality Rules

Metric	Minimum Data Coverage	Lookback
Steps	≥120 days	12 months
Sleep	≥90 days	6 months
VO$_2$ Max	≥3 readings	12 months
HR / HRV	≥60 days	6 months

Data Quality Score (DQS)

- High (≥80% completeness)

- Medium (50–79%)

- Low (<50%) → Manual review

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6. Core Underwriting Metrics & Scoring

Each applicant receives a **HealthKit Risk Score (HKRS)** from 0–100.

In addition, an **Age Adjustment Factor (AAF)** is applied to normalize HealthKit-derived metrics for expected physiological changes across age cohorts.

6.0 Age Adjustment Factor (AAF)

Age is treated as a **normalization and weighting factor**, not a direct penalty. Metrics such as VO$_2$ Max, resting heart rate, HRV, walking speed, and recovery are evaluated **relative to age-adjusted expectations**.

Age Band AAF Multiplier Underwriting Interpretation

Age Band	AAF Multiplier	Underwriting Interpretation
18–34	1.00	Peak physiological baseline

Age Band AAF Multiplier Underwriting Interpretation

Age Band	AAF Multiplier	Underwriting Interpretation
35–44	0.98	Mild age normalization
45–54	0.95	Expected fitness decline accounted for
55–64	0.92	Aging-adjusted scoring
65+	0.88	Senior normalization + mobility emphasis

Application Rule:

- AAF adjusts the *raw HealthKit sub-scores*, not traditional underwriting results
- Prevents penalizing healthy older applicants relative to younger cohorts

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6.1 Activity Score (Weight: 25%)

Metric	Threshold (Age-Adjusted)	Points
Avg steps/day	>8,000	25
	6,000–8,000	18
	4,000–5,999	10
	<4,000	0

Trend modifier:

- +3 points if 6-month upward trend
- −3 points if declining

6.2 Cardiorespiratory Fitness (Weight: 20%)

VO$_2$ Max (age & sex normalized)

Percentile	Points
≥75th	20
50–74th	15

Percentile	Points
25–49th	8
<25th	0

6.3 Heart Health (Weight: 20%)

Metric	Preferred Range (Age-Adjusted)	Points
Resting HR	50–70 bpm	10
HRV	≥ age-normalized 60th percentile	10

Partial credit applied if one metric meets criteria.

6.4 Sleep Health (Weight: 15%)

Metric	Points
Avg sleep 7–8 hrs	10
Consistency (±1 hr)	5

6.5 Body Composition Trend (Weight: 10%)

Trend (Age-Normalized)	Points
Stable or improving BMI / waist trend	10
Mild increase	5
Significant increase	0

6.6 Mobility & Aging Indicators (Weight: 10%)

Metric	Threshold (Age-Adjusted)	Points
Walking speed	> age 60th percentile	5
Steadiness	Normal	5

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7. HealthKit Risk Score (HKRS)

HKRS = (Weighted sum of HealthKit sub-scores) × Age Adjustment Factor (AAF)

Score bands:

- 85–100: Excellent

- 70–84: Very Good

- 55–69: Standard Plus

- 40–54: Standard

- <40: Substandard / Manual Review

HKRS = Weighted sum of all category scores

Score bands:

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8. Integration with Traditional Underwriting

HealthKit data **does not replace**:

- Medical questionnaires

- APS / labs (when required)

- MIB checks

Interaction Rules

- HKRS ≥85 → Eligible for best class if traditional data aligns

- HKRS 70–84 → Can improve one class (e.g., Standard → Standard Plus)

- HKRS <55 → No positive adjustment

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9. Risk Class Mapping (Life Insurance)

Traditional Result HKRS Impact Final Class

Traditional Result	HKRS Impact	Final Class
Preferred Plus	≥70	Preferred Plus
Preferred	≥85	Preferred Plus
Standard	≥70	Standard Plus
Standard	<55	Standard

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10. Health Insurance Use Cases

10.1 Premium Modifiers

- Up to 10% wellness discount

- Re-rated annually (opt-in)

10.2 Deductible Adjustments

- High HKRS → lower deductible option

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11. Automation vs Manual Review

Auto-Underwrite Eligible:

- HKRS ≥70

- High data quality

- No red flags in traditional underwriting

Manual Review Triggers:

- Rapid decline in activity or sleep

- HRV deterioration >20%

- Inconsistent or sparse data

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12. Explainability & Applicant Communication

Applicants receive:

- Summary scorecard

- Top 3 positive drivers

- Improvement opportunities (non-medical language)

Example:

"Your strong activity level and sleep consistency positively influenced your rating."

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13. Ongoing Monitoring (Optional)

For participating policyholders:

- Quarterly score refresh

- Rewards, not penalties

- Opt-out anytime

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14. Model Governance

- Annual actuarial validation

- Bias testing by age & gender

- Medical advisory sign-off

- Regulatory audit trail

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15. Future Enhancements

- Integration with lab results

- AI-driven trend clustering

- Personalized underwriting pathways

- Reinsurance-approved HKRS bands