

Population Analytics – Screening Coverage Overview

Secondary data | NHANES Data

Current screening criteria miss a significant portion of the population at high bone-health risk. This analysis identifies gaps in screening coverage and evaluates expanded eligibility logic.

Data source: NHANES 2005–2006 (N = 3,107 individuals)

4.02%

Baseline eligibility prevalence

125 individuals meet current screening criteria

17.38%

Risk prevalence

540 individuals at high bone-health risk based on clinical and lifestyle factors

16.35%

Missed High Risk

508 individuals at high risk but missed by baseline screening criteria

0.5%

Expanded screening logic coverage

16 individuals remain unidentified under expanded screening logic

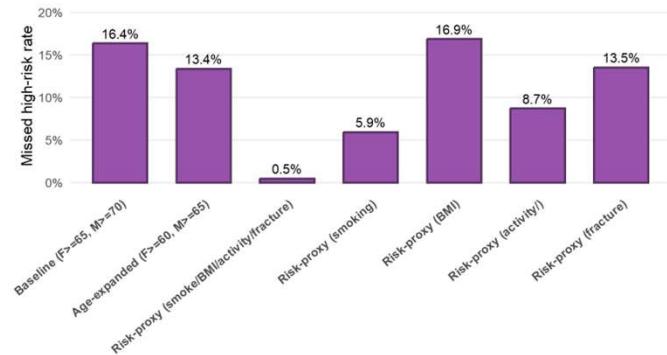
Priority population segments

- Segment A: Ages 60–64 (Female)
- Segment B: Ages 50–59 (Female)
- Segment C: Ages 65–69 (Male)
- Segment D: Ages 50–59 (Male)
- Segment E: Ages 60–64 (Male)

Proportions of missed high risk individuals within demographic segments.

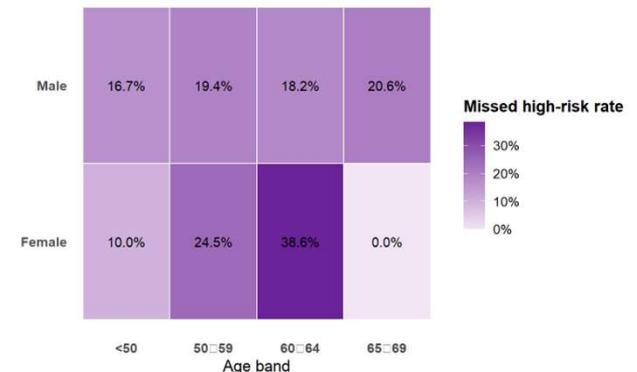
Expanded Screening Comparison

Comparing baseline age-based screening vs expanded screening logic



Missed High-Risk Rate by Age Band and Gender

Proportion of high-risk individuals not captured by age-based screening

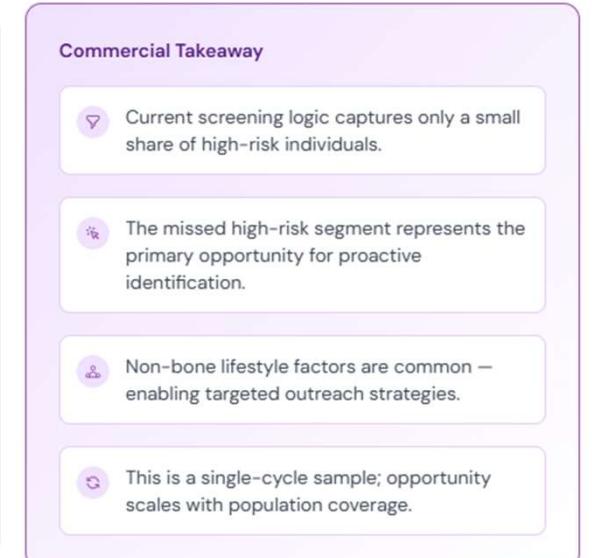
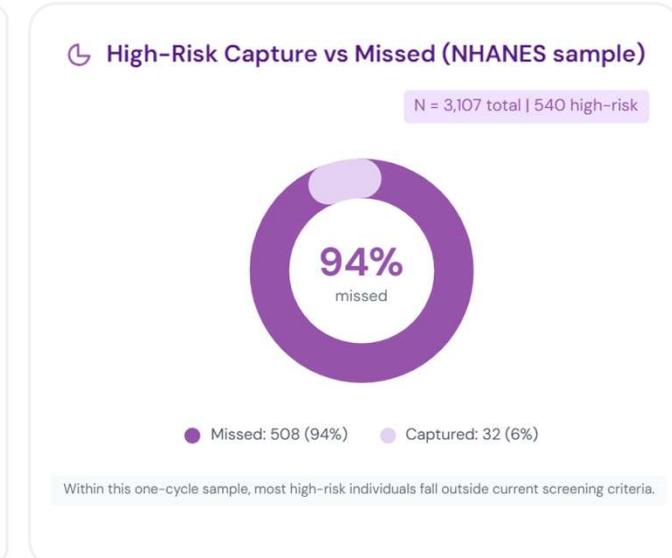
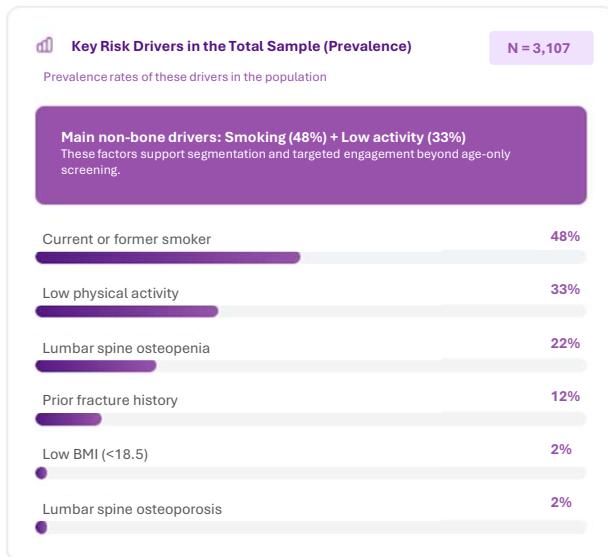


Screening Gap Opportunity - Bone-Health Risk Identification

NHANES 2005–2006 (N = 3107)



All figures are within this NHANES sample (single cycle) — illustrative scale only.



Governance | Data Quality, Assumptions, and Guardrails

Transparency and reproducibility

Data Sources

- **NHANES 2005–2006:** Demographics, Body Measures, DXA, Osteoporosis, Smoking, Physical Activity
- **Merged by respondent ID (SEQN)**

Assumptions Log (Key)

- **Screening eligibility proxy:** Female ≥ 65 , Male ≥ 70 (baseline)
- **High risk definition:** Lumbar spine T-score osteoporosis OR osteopenia + ≥ 1 risk proxy
- **Risk proxies:** low BMI, smoking history, low activity, prior fracture
- **DXA multiple imputations:** analysis uses imputation 1 for portfolio demonstration

Limitations

- Secondary, cross-sectional data
- Self-reported diagnosis and fracture history
- Exploratory analytics; not diagnostic or causal inference

Data QA Summary

Quality Assurance Checklist

- ✓ Missingness reviewed ✓ Conservative rules applied

Variable-level Missing Cells Summary

Variable	Missing Count	% Missing
SMD030	1619	52.11
SMQ040	1619	52.11
BMXBMI	12	0.39
low_bmi	12	0.39
smoker_status	2	0.06
SEQN	0	0.00
RIDAGEYR	0	0.00
RIAGENDR	0	0.00
RIDRETH1	0	0.00
WTMEC2YR	0	0.00
DXXLSBMD	0	0.00
tscore_spine	0	0.00
spine_class	0	0.00
OSQ010A	0	0.00
OSQ010B	0	0.00
OSQ010C	0	0.00
OSQ060	0	0.00
prior_fracture	0	0.00
SMQ020	0	0.00
PAD200	0	0.00
PAD320	0	0.00
low_activity	0	0.00

How Missingness Was Handled:

- Smoking Variables: NA if <100 cigarettes across lifetime (automatically coded Non-smoker)
- Missing BMI (N = 12): Retained, low-BMI risk conservatively coded
- “Don’t know” smoking (N = 2): Retained, status conservatively absent

Data Freshness

CYCLE	2005–2006
PUBLISHED	CDC NHANES
REFRESH CADENCE	Static public release

Equity Risks & Guardrails

- **Guardrail metric:** missed high-risk rate by race/ethnicity
- **Action:** monitor for disproportionate exclusion under scenario screening

