

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)

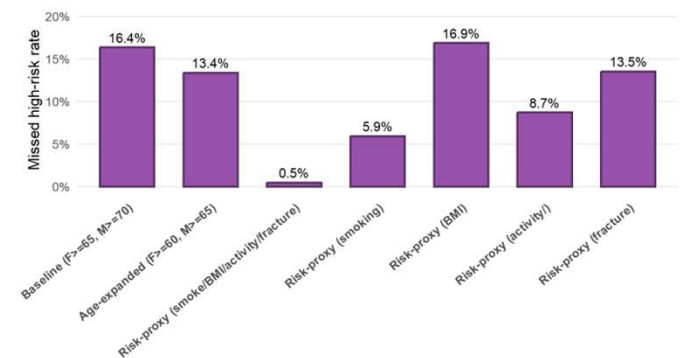
Segment D: Ages 50–59 (Male)

Segment E: Ages 60–64 (Male)

Proportions of missed high risk individuals within demographic segments.

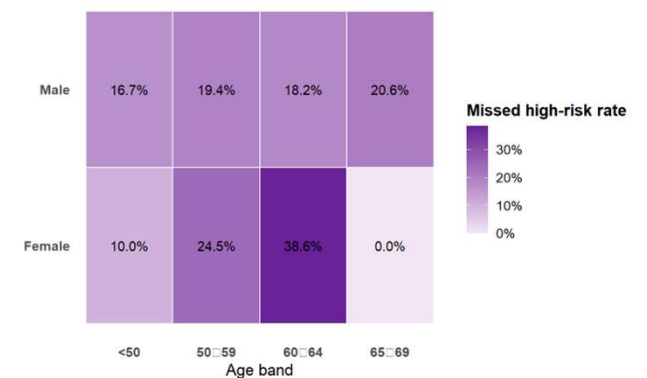
Expanded Screening Comparison

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)

 HIGH-RISK INDIVIDUALS

540

Total identified in sample

 MISSED HIGH-RISK

508

Not captured by screening

 MISS RATE

94%

508 of 540 high-risk

 CAPTURED

32

By current screening

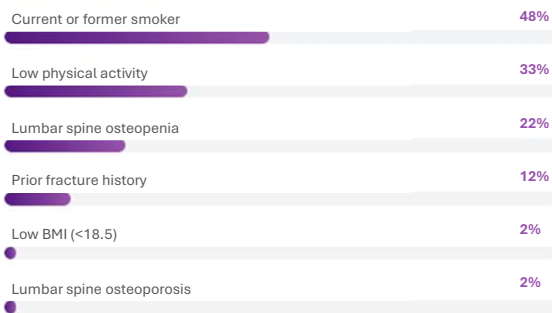
All figures are within this NHANES sample (single cycle) — illustrative scale only.

Key Risk Drivers in the Total Sample (Prevalence)

N = 3,107

Prevalence rates of these drivers in the population

Main non-bone drivers: Smoking (48%) + Low activity (33%)
These factors support segmentation and targeted engagement beyond age-only screening.



High-Risk Capture vs Missed (NHANES sample)





N = 3,107 total | 540 high-risk



● Missed: 508 (94%) ● Captured: 32 (6%)

Within this one-cycle sample, most high-risk individuals fall outside current screening criteria.

Commercial Takeaway

-  Current screening logic captures only a small share of high-risk individuals.
-  The missed high-risk segment represents the primary opportunity for proactive identification.
-  Non-bone lifestyle factors are common — enabling targeted outreach strategies.
-  This is a single-cycle sample; opportunity scales with population coverage.

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 |
| DXLXSBMD | 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

