NO OBSERVED DIFFERENCE IN THE RATE OF CONVERSION TO OSTEOPOROSIS IN AT-RISK WOMEN YOUNGER THAN 65 YEARS VERSUS WOMAN 65 YEARS AND OLDER AT THE TIME OF THEIR INITIAL DEXA SCAN

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BACKGROUND

- According to the United States Preventive Services Task Force (USPSTF) guidelines, osteoporosis screening is recommended for all women aged 65 and older, as well as for younger women who are considered at-risk due to factors such as medication side effects or incidence of osteoporotic fractures.
- Osteoporosis screening is conducted using dual-energy X-ray absorptiometry (DEXA), a non-invasive imaging study that measures bone mineral density (BMD) in the femoral neck, total hip, lumbar spine, or distal radius. The test generates a T-score, comparing the patient's BMD to that of healthy young adults of the same sex, and categories individuals with a T-score of ≤ -2.5 as osteoporotic.
- Despite these recommendations, osteoporosis screening rates remain low nationwide, increasing the risk of falls, fractures, mobility loss, permanent disability, and even death.
- With an aging population, osteoporosis-related complications and low screening rates are expected to rise, particularly in Hawaii, which has one of the highest proportions of adults aged 65 and older in the United States.
- Understanding osteoporosis trends within one of Hawaii's integrated healthcare systems can offer valuable insights into better implementing or updating guideline-based recommendations as well as reducing osteoporosis-related complications in Hawaii's aging population.

OBJECTIVE

Identify differences and similarities in women whose initial DEXA scan was performed before the age of 65 years old compared to those whose initial scan was performed at 65 years and older.

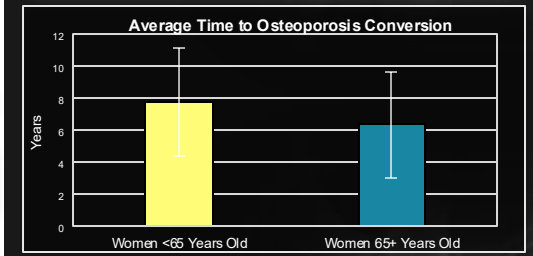
METHODOLOGY

- A retrospective analysis was conducted on all women who underwent more than one DEXA scan after 12/31/2009 in which at least one scan was performed between the dates 1/1/2017 to 3/15/2024.
- For each study, we recorded the lowest T-score and its corresponding bone marrow density and scan location. We then segregated the patients based on their age at the time of their earliest scan.
- All statistical tests were 2-tailed with a significance level set at p<.05. Categorical and ordinal data analyses were performed using chi-square and Mann-Whitney tests. Continuous data analyses were performed using T-tests.

RESULTS

Category	N	<65 years	+65 years
Status at Initial Scan	Total	1769	1373
	Not Osteoporotic (T-score >-2.5)	1338	949
	Osteoporotic (T-score ≤-2.5)	431	424
Status at Final Scan	Total	1338	949
	Not Osteoporotic (T-score >-2.5)	1027	744
	Osteoporotic (T-score ≤-2.5)	311	205

- Among women aged 65 years and older, 30.9% (424/1,373) were osteoporotic, as determined by a T-score of ≤ -2.5, compared to 24.4% (431/1,769) of women under 65.
- The rate of conversion to osteoporosis did not significantly differ between the two groups (23.2% in women <65 years vs. 21.6% in women ≥65 years; $X^2(1, 2,287) = 0.35$, p = .05).



- Among those who were not osteoporotic at baseline, women aged 65 years and older converted within 6.4 ± 3.3 years, whereas those younger than 65 converted within 7.8 ± 3.4 years (p < .001).
- Women under 65 underwent an average of 3.6 ± 1.5 scans, compared to 3.2 ± 1.3 scans in women 65 and older (Mann-Whitney z = 7.43, p < .001).
- The average time between scans was 2.9 ± 1.2 years for women under 65 and 2.5 ± 1.0 years for women 65 and older (p < .001).
- The average follow-up duration from the initial to the last scan was 9.5 ± 2.9 years for women under 65 and 7.6 ± 3.1 years for women 65 and older (p < .001).

DISCUSSION

Higher Prevalence of Osteoporosis in Older Women:
- As expected, osteoporosis was more common in women aged 65 and older (30.9%) compared to those under 65 (24.4%). This aligns with known age-related bone loss and supports current screening guidelines that prioritize DEXA scans for older women.

Longer Time to Osteoporosis Conversion in Younger Women:
- Women under 65 years old took longer to convert to osteoporosis (7.8 years vs. 6.4 years in ≥65 years old, p < .001), which is consistent with the slower rate of bone loss in younger individuals seen in other studies.

More Frequent Scanning and Longer Follow-up Durations in Younger Women
- Women under 65 underwent more scans on average (3.6 vs. 3.2, p < .001) and had longer follow-up durations (9.5 years vs. 7.6 years, p < .001). In addition, there was a shorter duration between scans in younger women (2.9 years vs. 2.5 years, p < .001), which may indicate more aggressive screening practices in at-risk patients.

Similar Osteoporosis Conversion Rates Across Age Groups but Potential Lead Time Bias in Woman Under 65 Years Old:
- The rate of conversion to osteoporosis did not significantly differ between the two groups (23.2% in <65 vs. 21.6% in ≥65). This suggests that younger women who do not have osteoporosis at baseline are just as likely to develop the condition over time as older women, which challenges the assumption that older age alone drives faster progression to osteoporosis.
- However, the similar rates of conversion between younger and older women may also be explained by a lead-time bias.

Limitations:
- The primary limitation of this study was the imbalance in sample sizes between age groups. Patient selection was based on the number of DEXA scans performed within a given timeframe, which resulted in a higher proportion of women under 65, as they were scanned more frequently.

CONCLUSION

Higher Prevalence of Osteoporosis in Older Women:
- Current USPSTF guidelines recommend DEXA screening primarily for women ≥65 years old or younger women with risk factors.
- Our data aligns with known age-related bone loss and supports the current national screening guidelines that prioritize DEXA scans for older women in Hawaii.

Targeting High-Risk Populations More Effectively in Screening Practices:
- Our findings suggest that screening younger women may lead to prolonged surveillance without a significant difference in conversion rates or immediate clinical consequences.
- It may be beneficial to establish clearer guidelines on appropriate re-screening intervals based on individual risk (e.g., corticosteroid use, family history, or low body weight) for more personalized screening strategies.

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