MrOS WHO FRAX™ Data

The dataset W1FEB17 includes WHO FRAX™ data that were completed using risk factors collected at the MrOS baseline visit.

FRAX data is also available at visit 2, sleep, visit 3, sleep visit 2, visit 4 and repeat visit 4

Data was updated at the FEB17 release. The version was updated to be 3.12. Variables used for Rheumatoid Arthritis were also updated to pull forward from previous visits since RA is a chronic condition.

Updates to the FRAX software handle missingness in risk factors factors (previous history of fracture, parental history of hip fracture, smoking status, use of corticosteroids, presence of rheumatoid arthritis, and 3 or more alcohol use) as if it were no. Missing data in other covariates such as BMI will result in missing frax scores.

FRAX software handles missing risk factors as if they are 0.

Please see a variable naming guide at the end of this document.

The FRAX 10-year fracture probabilities were provided by Dr. John Kanis and include:

10 year probability (%) of osteoporotic fracture, calculated without knowing BMD
10 year probability (%) of hip fracture, calculated without knowing BMD
10 year probability (%) of osteoporotic fracture, calculated with knowing BMD*
10 year probability (%) of hip fracture, calculated with knowing BMD*

The definition of osteoporotic fracture includes hip, clinical spine, humerus, and wrist fractures. The 10-year probability was calculated from the risk factors at baseline for each patient and applied to a formula which was created based on the relationship between risk factors (age, sex, body mass index (BMI), previous history of fracture, parental history of hip fracture, current smoking, use of corticosteroids in past 3 months, presence of rheumatoid arthritis, and 3 or more alcoholic beverages per day) and outcome in 9 prospective population-based cohorts from around the world. The 10-year probabilities for both hip and major osteoporotic fracture can be calculated with or without femoral neck BMD.

The risk factor for previous history of fracture was calculated with and without including prevalent vertebral fractures with an SQ≥2 at baseline and visit 2. Please see relevant documentation for the XM datasets for more information about our data on prevalent vertebral fractures. Variables ending in SQ include

prevalent vertebral fractures of SQ≥2 in the previous history of fracture, while those without an SQ do not.

For participants who had any missing dichotomized risk factors (previous history of fracture, parental history of hip fracture, smoking status, use of corticosteroids, presence of rheumatoid arthritis, and 3 or more alcohol use), their risk factor values are treated as if they were 0=no by FRAX software, and all 4 FRAX 10-year fracture probabilities were calculated. Data are missing for two participants whose BMI values were unavailable (PO7109 and PO7237). 10-year probabilities of osteoporotic fracture with BMD and hip fracture with BMD are missing for one participant who didn't have femoral neck BMD measurement (MN2244). Participants with completed non-missing baseline risk factors can be identified by using variable WOMISS=0.

Standard cutpoints of 3% for hip and 20% for major osteoporotic fracture are provided in the dataset.

Please see reference for more information:

Kanis, J.A., et al., *FRAX and the assessment of fracture probability in men and women from the UK.* Osteoporos Int, 2008. **19**(4): p. 385-97.

All variables in the MrOS WHO FRAX^{TM} data set begin with **WO**.

Variables passed to FRAX:

Variable	Correponding MrOS data	How it was calculated
Race/ethnicity	GIERACE	
Age	GIAGE1	
Sex		"Male" for all participants
BMI	HWBMI	
Prior history of fracture	FFFX50	Set those with 2=fx before age 50 to 0
Parental history of hip fracture	calculated from FFMOMHIP and FFDADHIP	If FFMOMHIP or FFDADHIP=1 then this is 1. If MOMHIP=0 and DADHIP=0 then this is 0. If the answer for 1 parent is 0 and the second parent is missing, this is set to 0.
Current Smoker	TURSMOKE	If TURSMOKE=2 (current) then this is 1. If TURSMOKE=0 (never) or1 (past) then this is 0.
Corticosteroid use (current use)*	M1CORTO*	
Rheumatoid Arthritis (ever had)*	MHARTH and MHRHEUM*	If MHRHEUM=1 then this is 1. If MHARTH=0 or MHRHEUM=0 then this is 0.
Secondary osteoporosis		Set all to 0.
3 or more alcoholic drinks/day	TUDRPRWK	If TUPRDRWK/7>=3 then this is set to1. IF .z<TURDRPRWK/7<3 then this is set to 0.
Machine Type		"Hologic" for all participants
Femoral Neck T-score	B1FND	All used norms from Looker 1998 paper Non-Hispanic White Female age 20-29 category, trimmed to 3 decimal places.

*At baseline, we use current use for corticosteroids (M1CORTO asks about current use) For subsequent visits, we pull variables from previous visits forward. Similarly, with Rheumatoid Arthritis, data from previous visits will be pulled forward. (ie, if someone reports RA at baseline but not at visit 2, we will code as having RA at visit 2 and all visits after baseline). Missing data in these variables is treated as 0=no in the FRAX software.

FRAX Variable Name Guide	**HIP**	**MAJOR OP FX**
10 Year Probability w/BMD	WOHIPW*[#]	WOOSTW*[#]
Binary variable above cutpoint (3% for Hip, 20% for Major)	WOHIPW3	WOOSTW20
10 Year Probability w/o BMD	WOHIPWO	WOOSTWO
Binary variable above cutpoint (3% for Hip, 20% for Major)	WOHIPWO3	WOOSTWO20
10 Year Probability w/BMD, Including SQ Fractures	WOHIPWSQ*	WOOSTWSQ*
Binary variable above cutpoint (3% for Hip, 20% for Major)	WOHIPW3SQ*	WOOSTW20SQ*
10 Year Probability w/o BMD, Including SQ Fractures	WOHIPWOSQ	WOOSTWOSQ
Binary variable above cutpoint (3% for Hip, 20% for Major)	WOHIPWO3SQ	WOOSTWO20SQ

*not released in FEB16. Should be released after completion of visit 4, likely in fall of 2016, or FEB17

part of baseline W1FEB12 dataset. Use this dataset for FRAX variables that use FRAX version 3.3