WEO

The voice of world endoscopy

# Incorporating demographic information

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# Disclosures

No conflicts to disclose

# Take-home Message

Using different FIT positivity thresholds,

based on demographic information

would reduce differences in FIT performance and restore equity and efficiency in CRC screening.

# Demographic information is known: Age and Sex

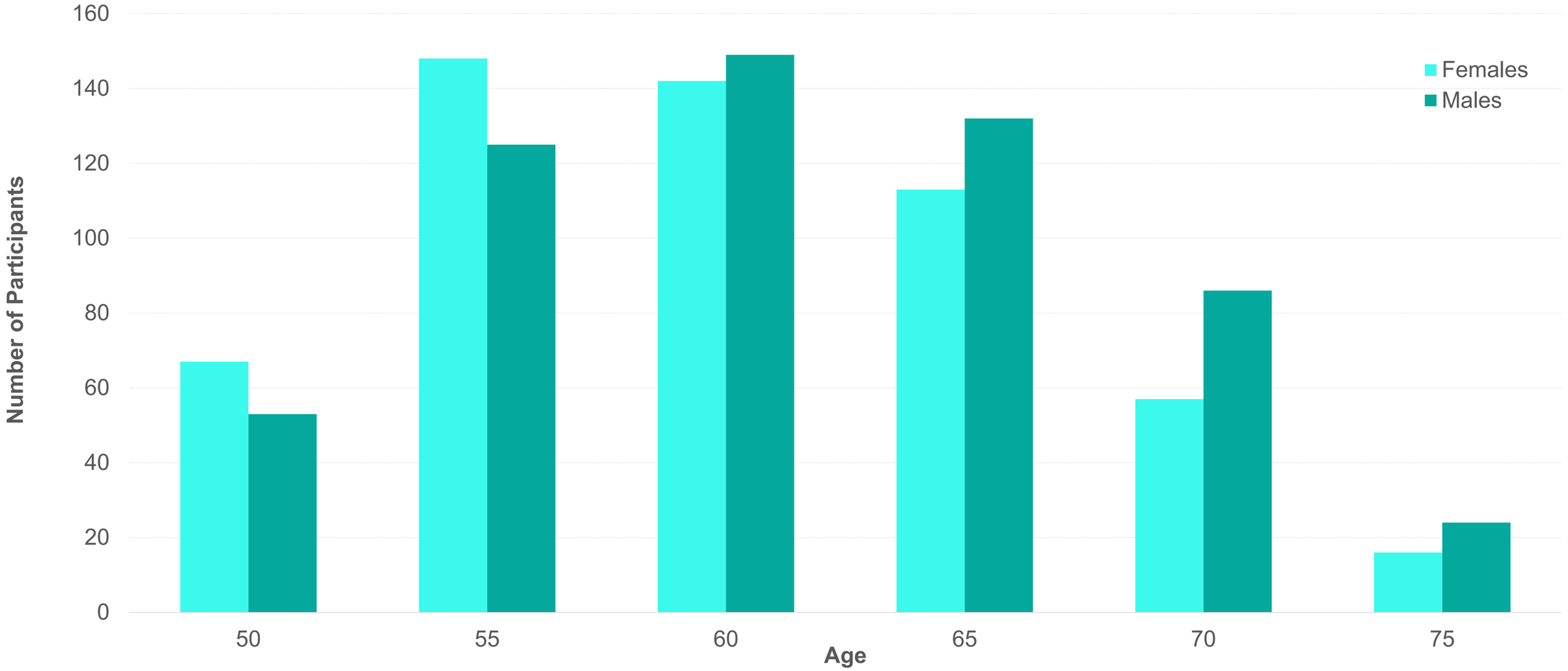
# Age and Sex in FIT screening: Illustration

- population-based invitational screening pilot
- 1,121 asymptomatic screen-naïve participants (50-75 years)
  - Screening Colonoscopy
  - One sample FIT (OC-Sensor)
- Blinded evaluation
- Advanced Neoplasia: Carcinoma & Advanced Adenoma
  (≥ 10 mm, villous histology ( ≥ 25 % villous), high-grade dysplasia)

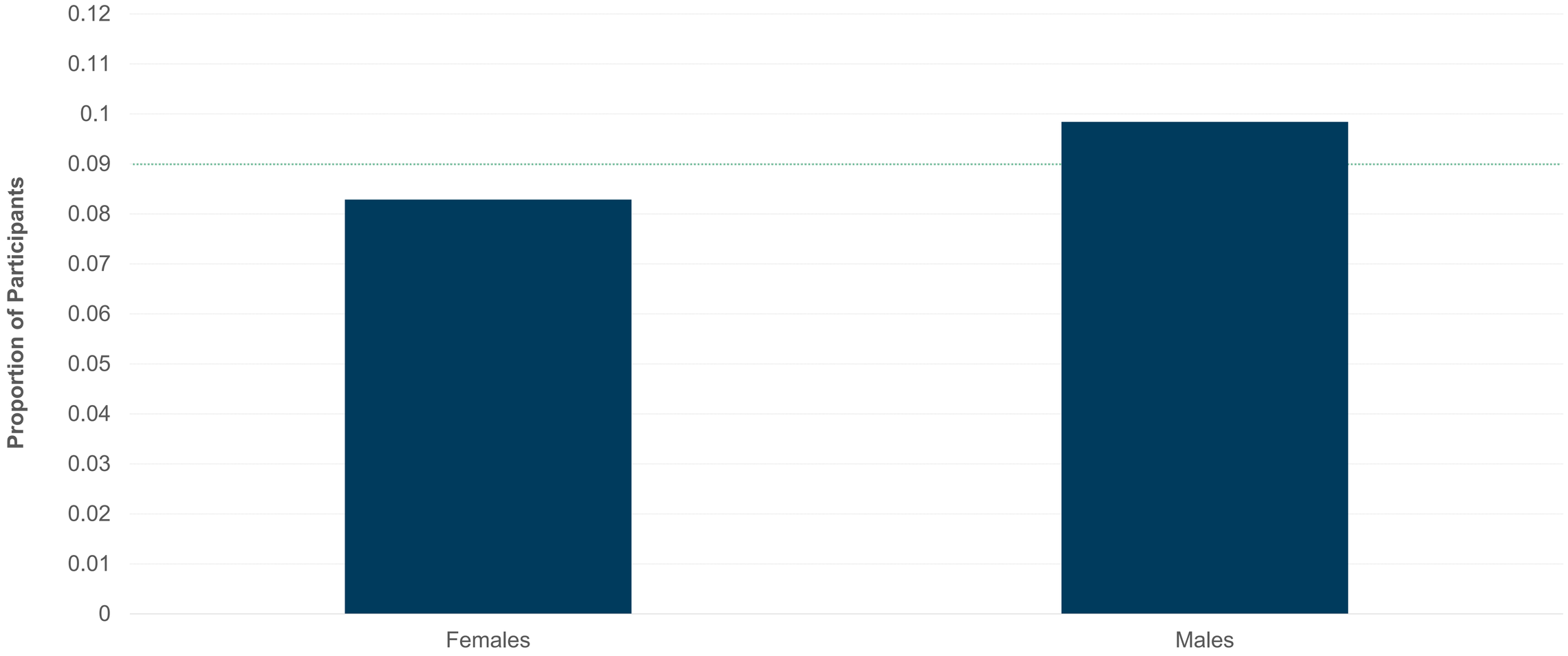
Netherlands Trial Register 1829

*Am J Gastroenterol* 2012; 107:1570–1578; doi:10.1038/ajg.2012.249

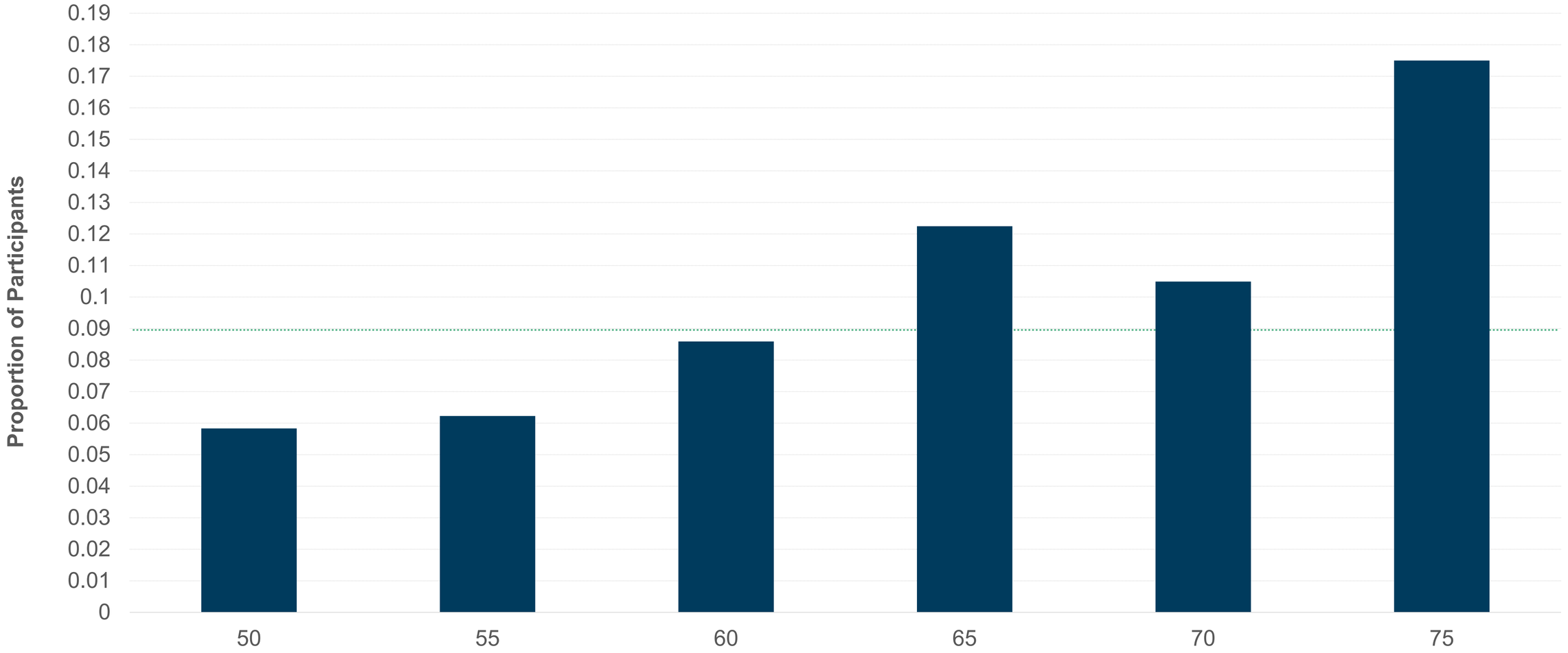
# Participants: Age and Sex



# Participants with Advanced Neoplasia by Sex

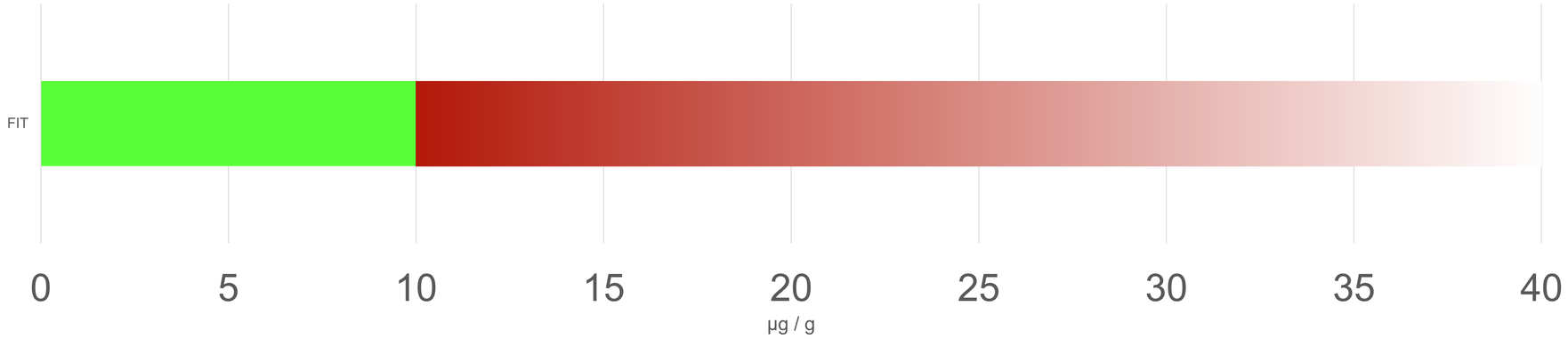


# Participants with Advanced Neoplasia by Age



# Quantitative FIT

# FIT: Single Positivity Threshold



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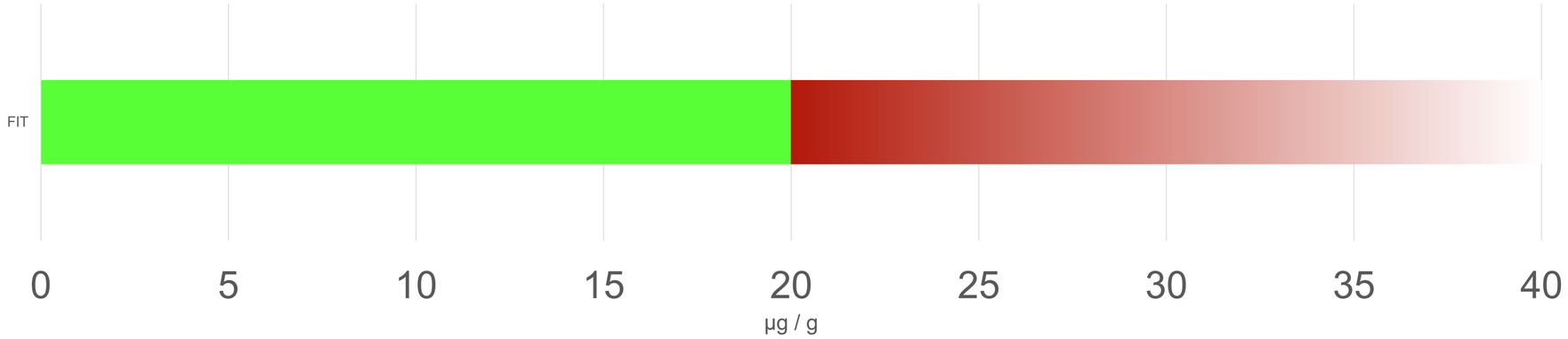

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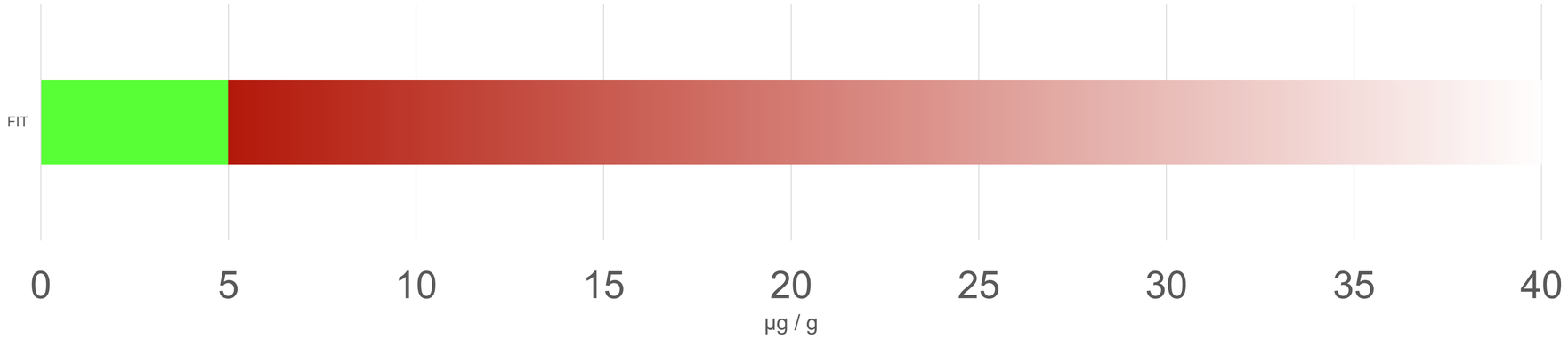

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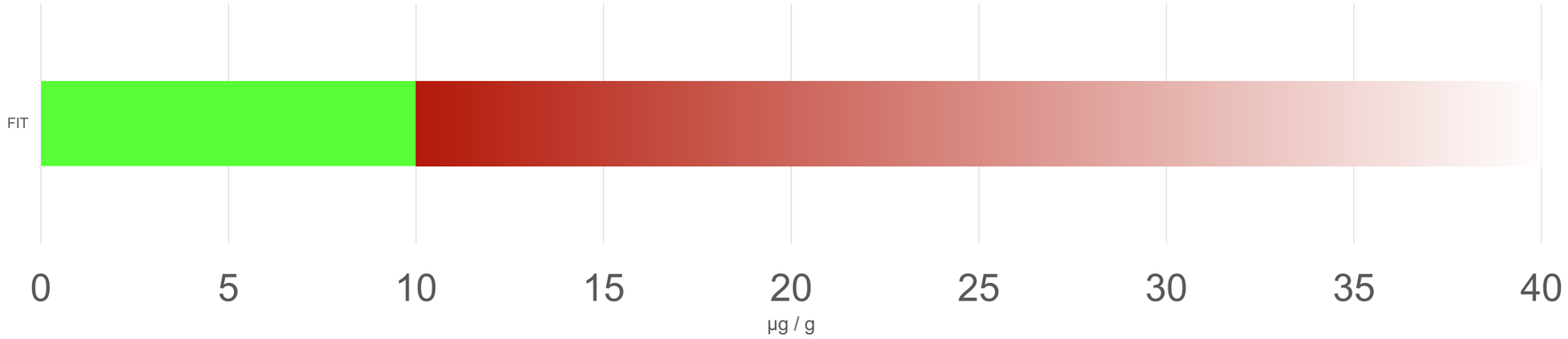
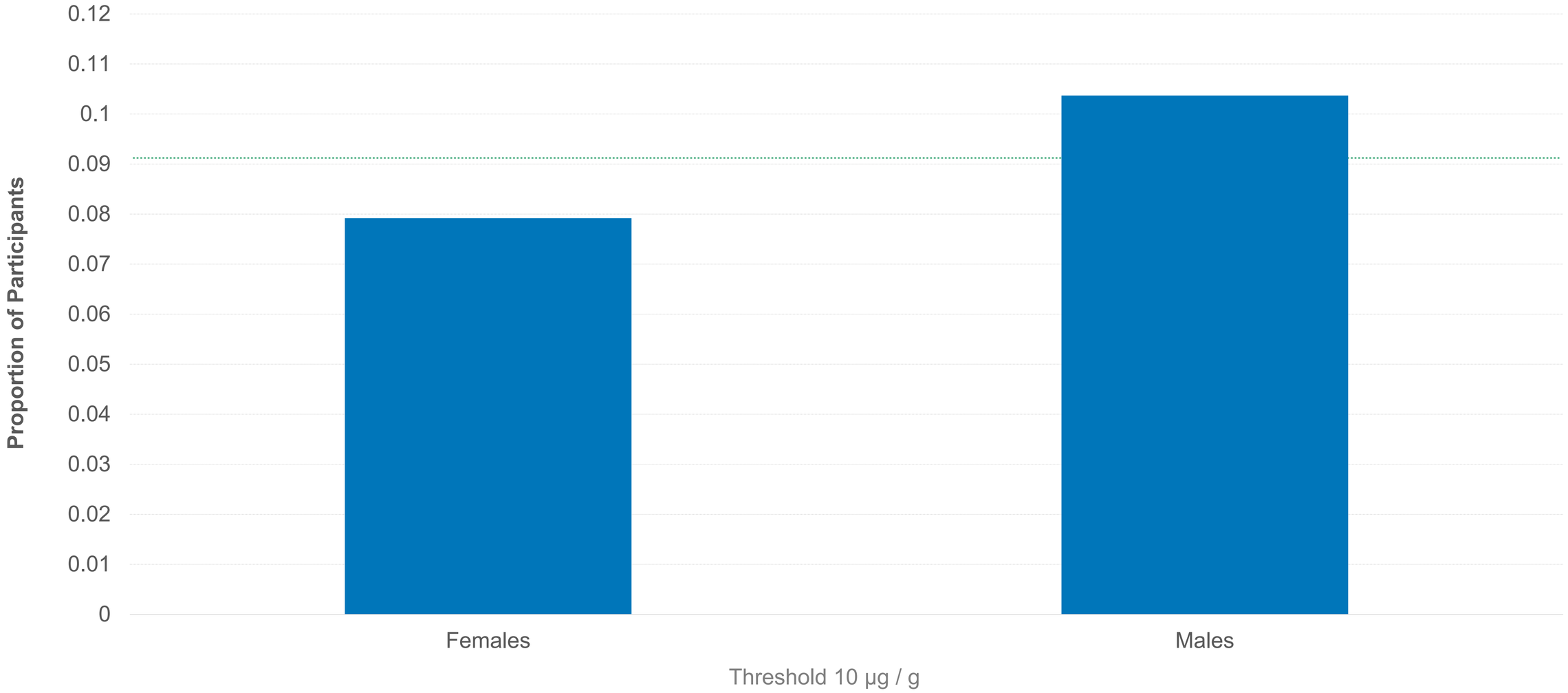
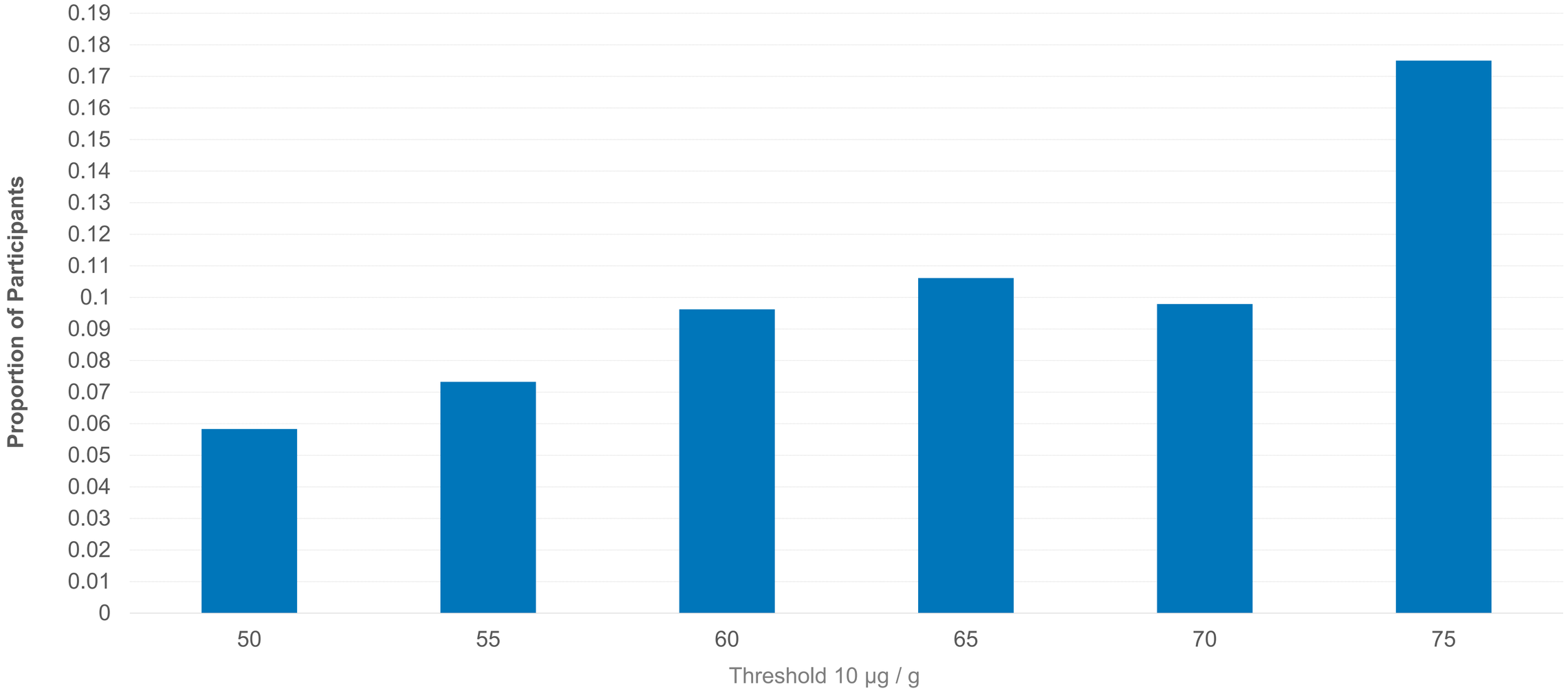



ONE SIZE
FITS ALL

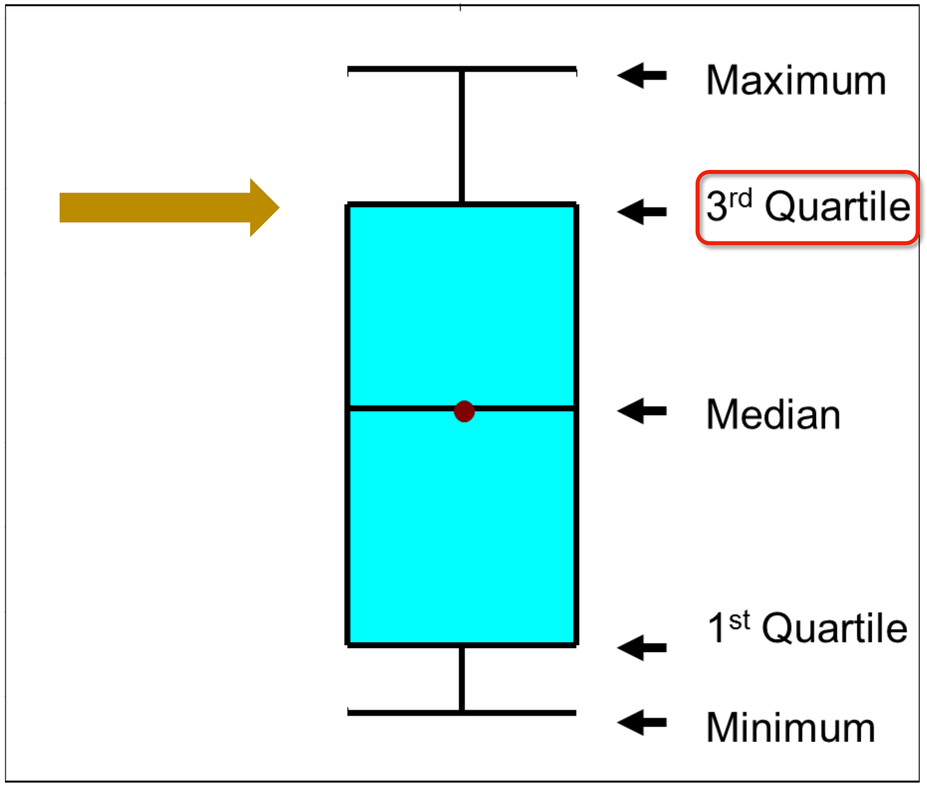
# FIT positivity by Sex



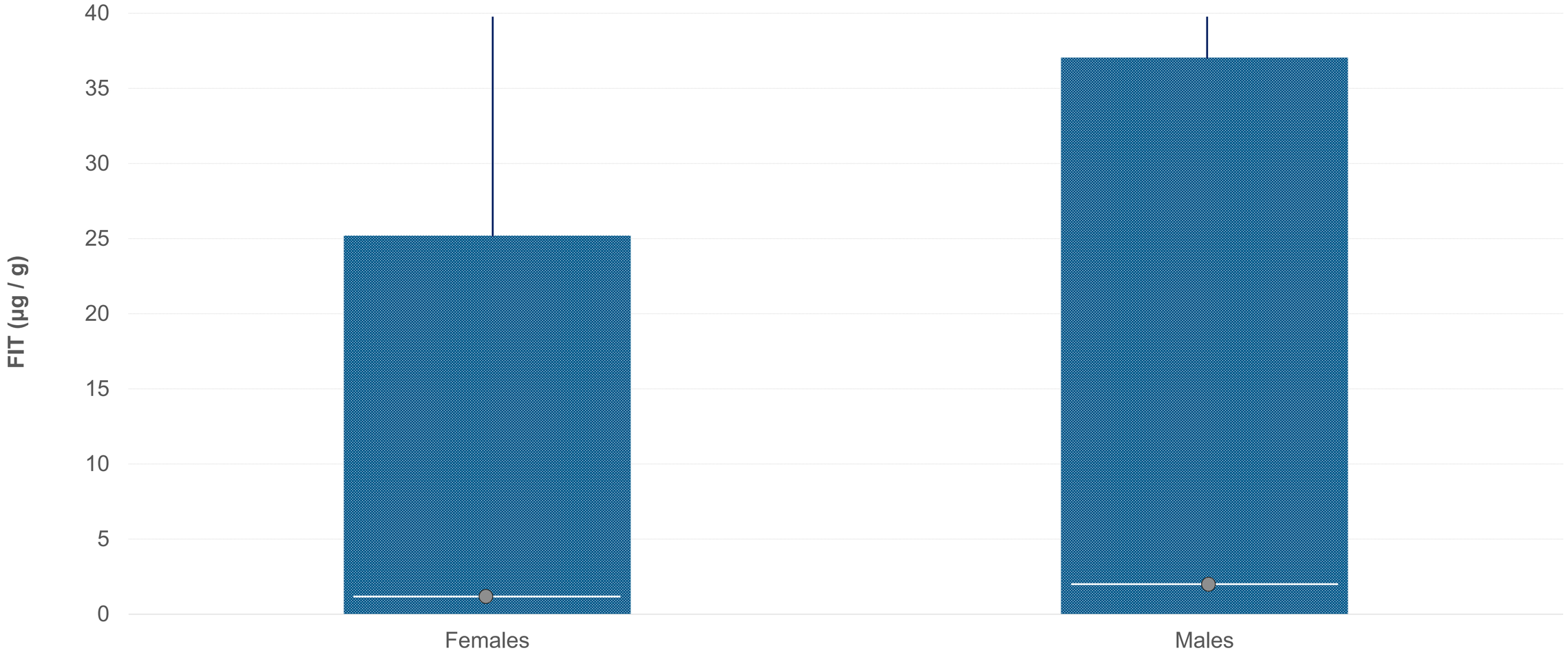
# FIT positivity by Age



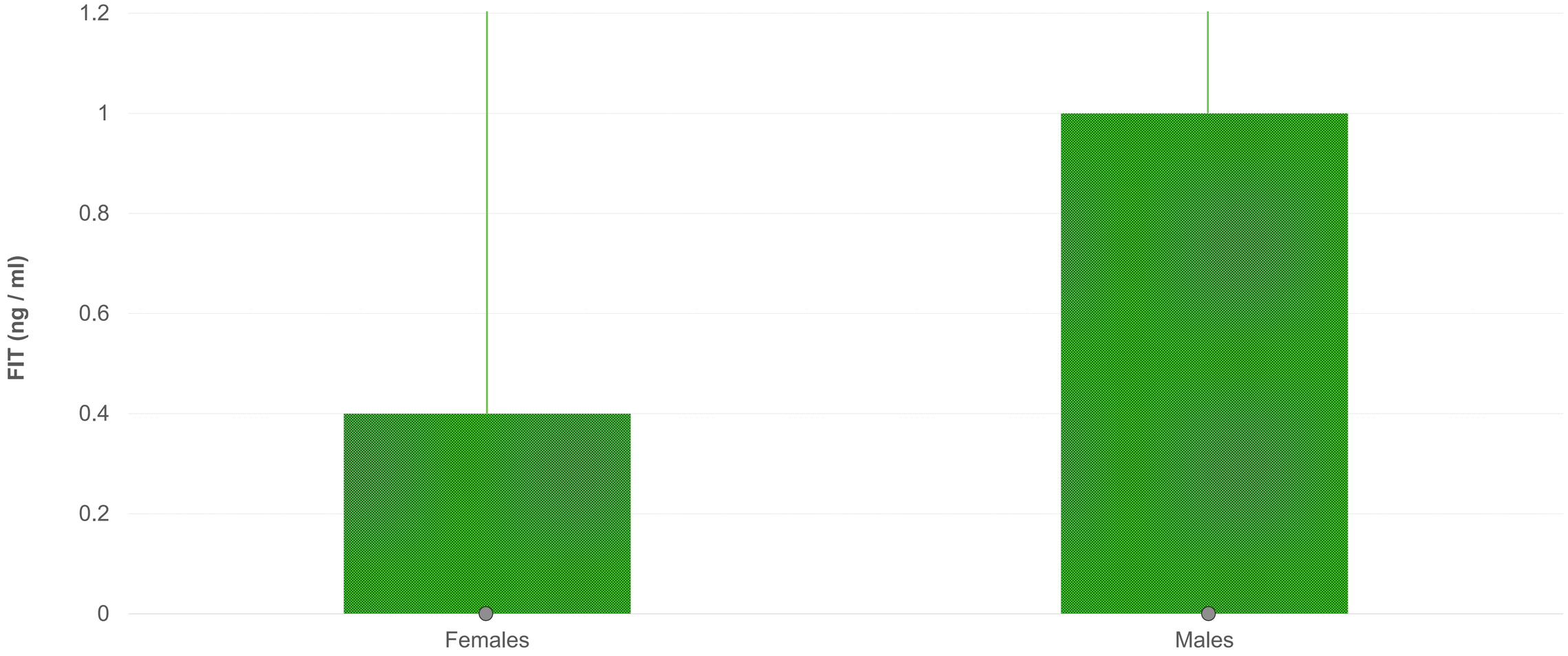
# Distribution of FIT results



# Participants *with* advanced neoplasia: Q3 by Sex



# Participants *without* advanced neoplasia: Q3



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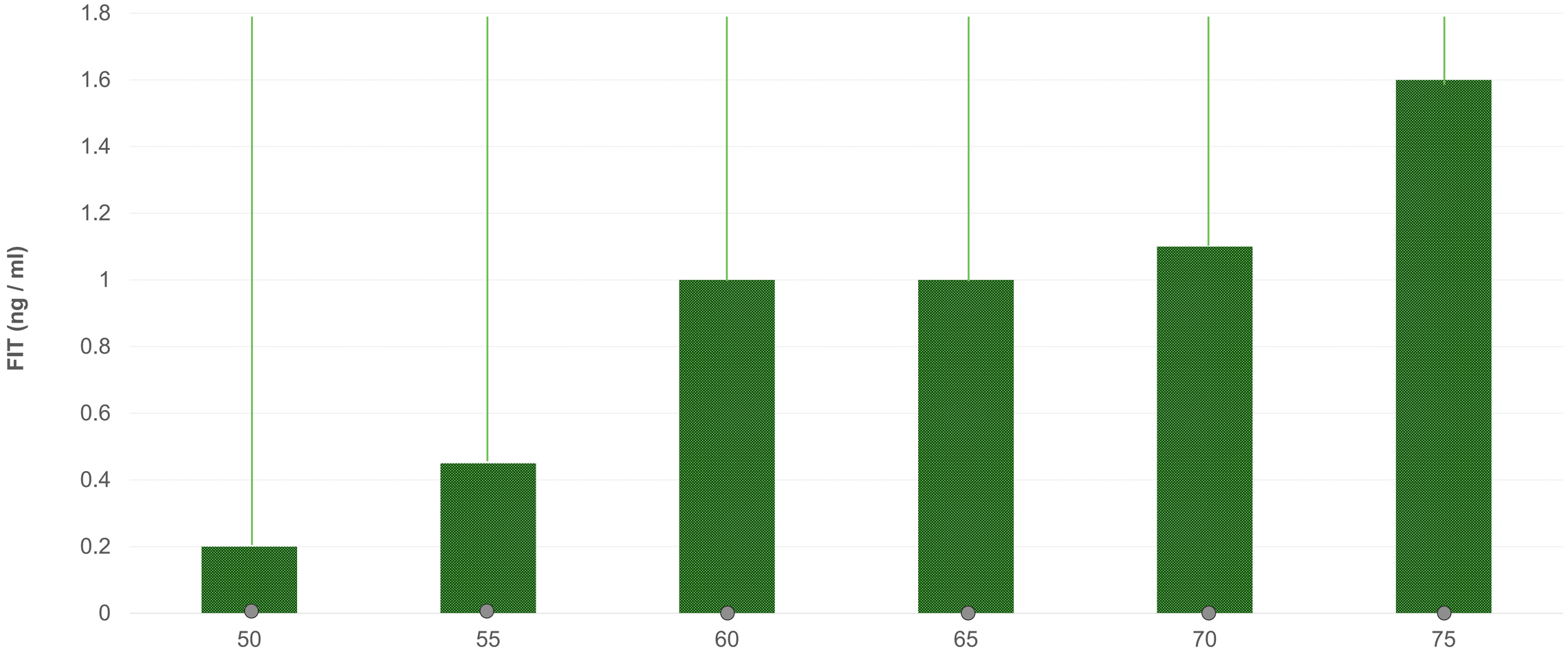
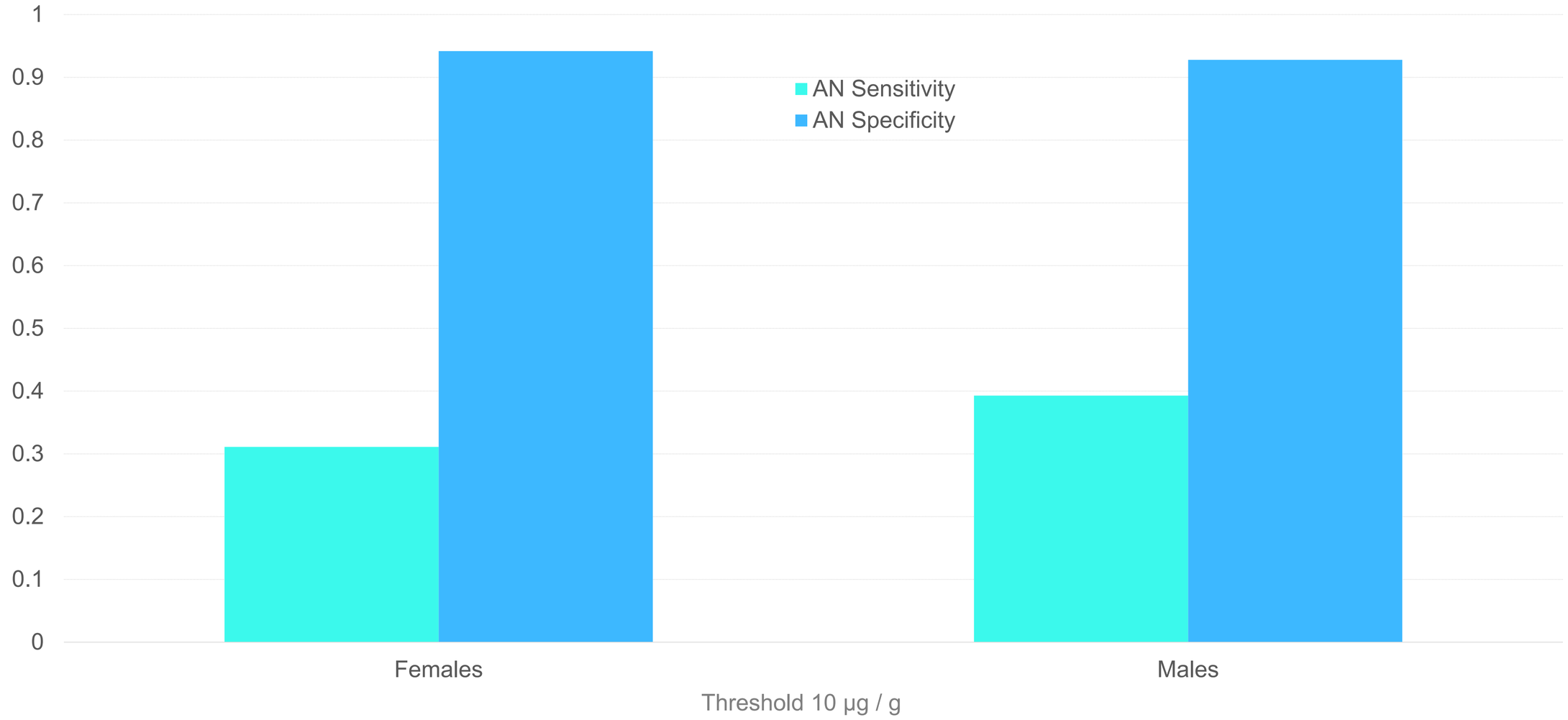


# FIT: Sensitivity & Specificity by Sex



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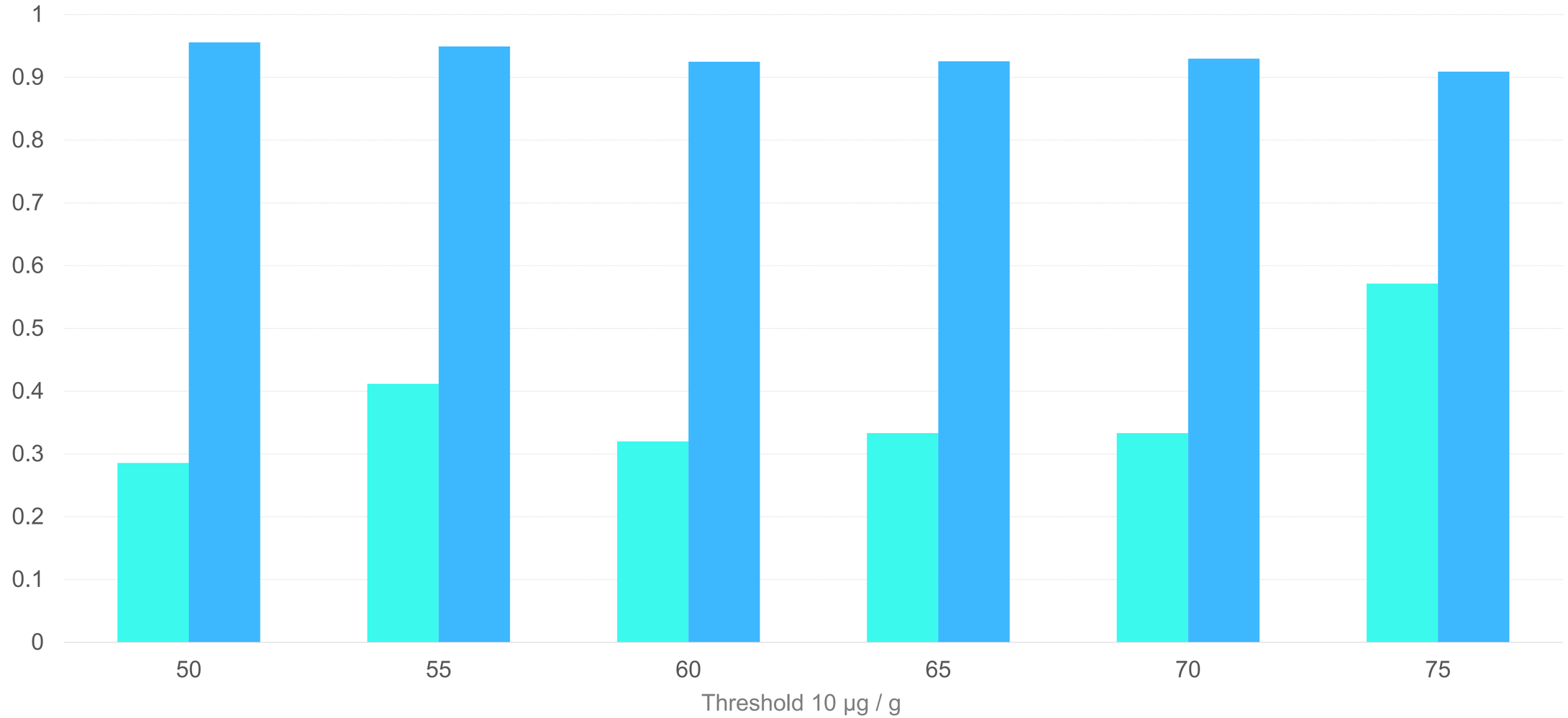
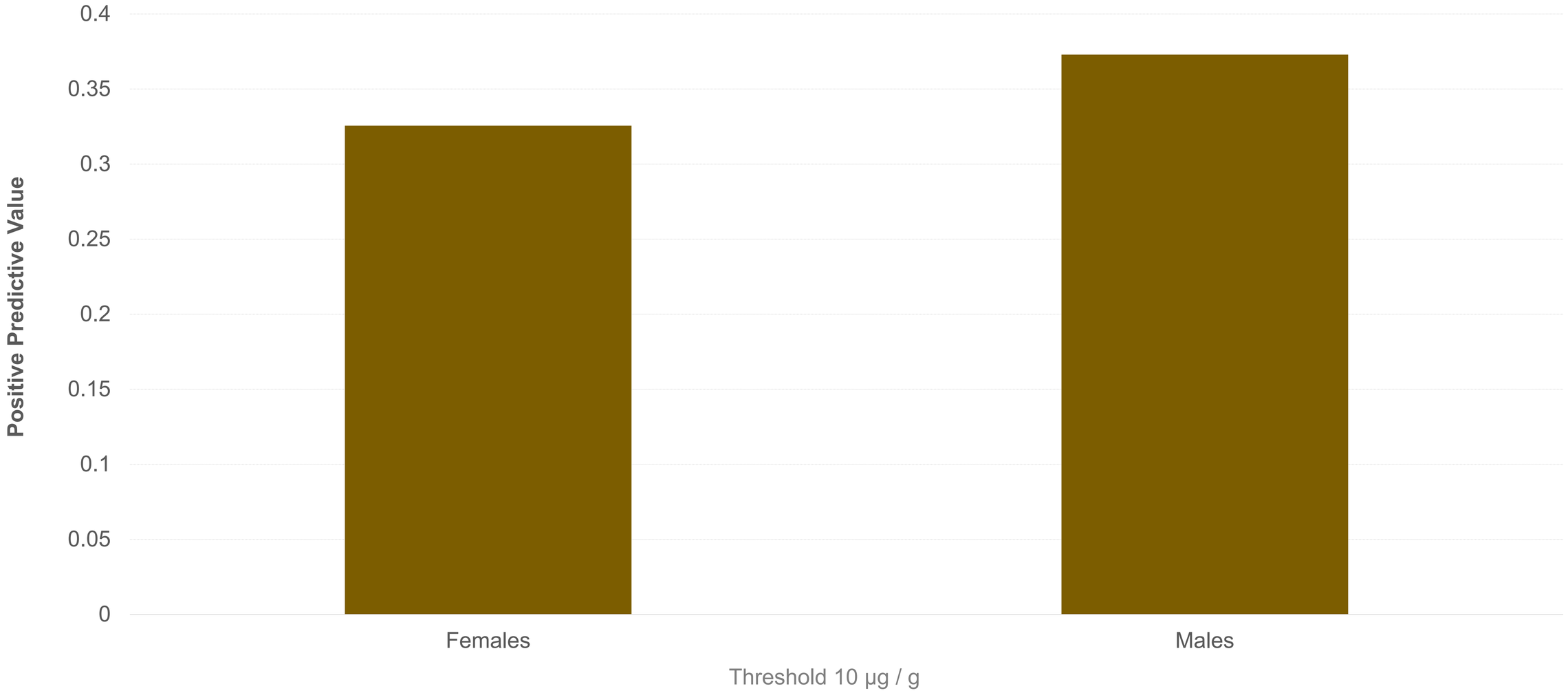


# FIT: Positive Predictive Value by Sex



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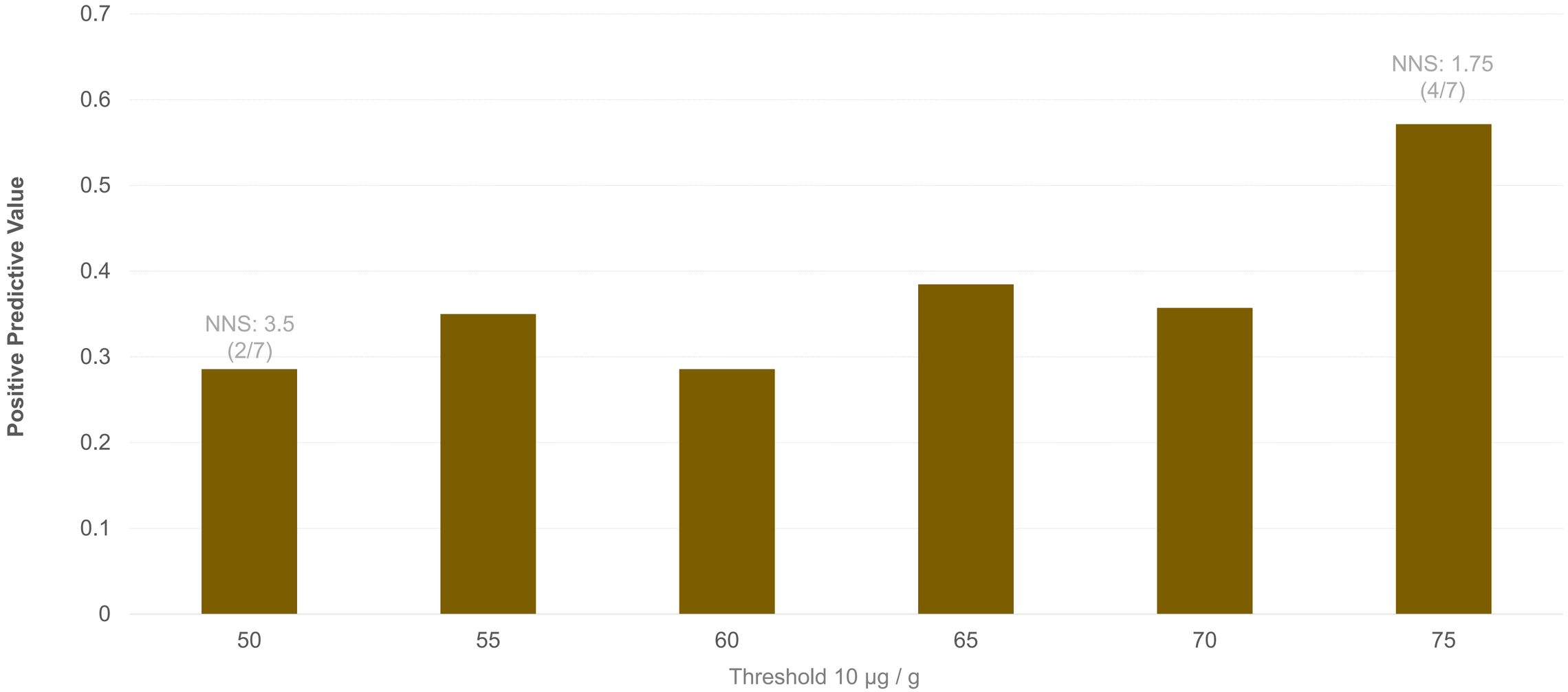
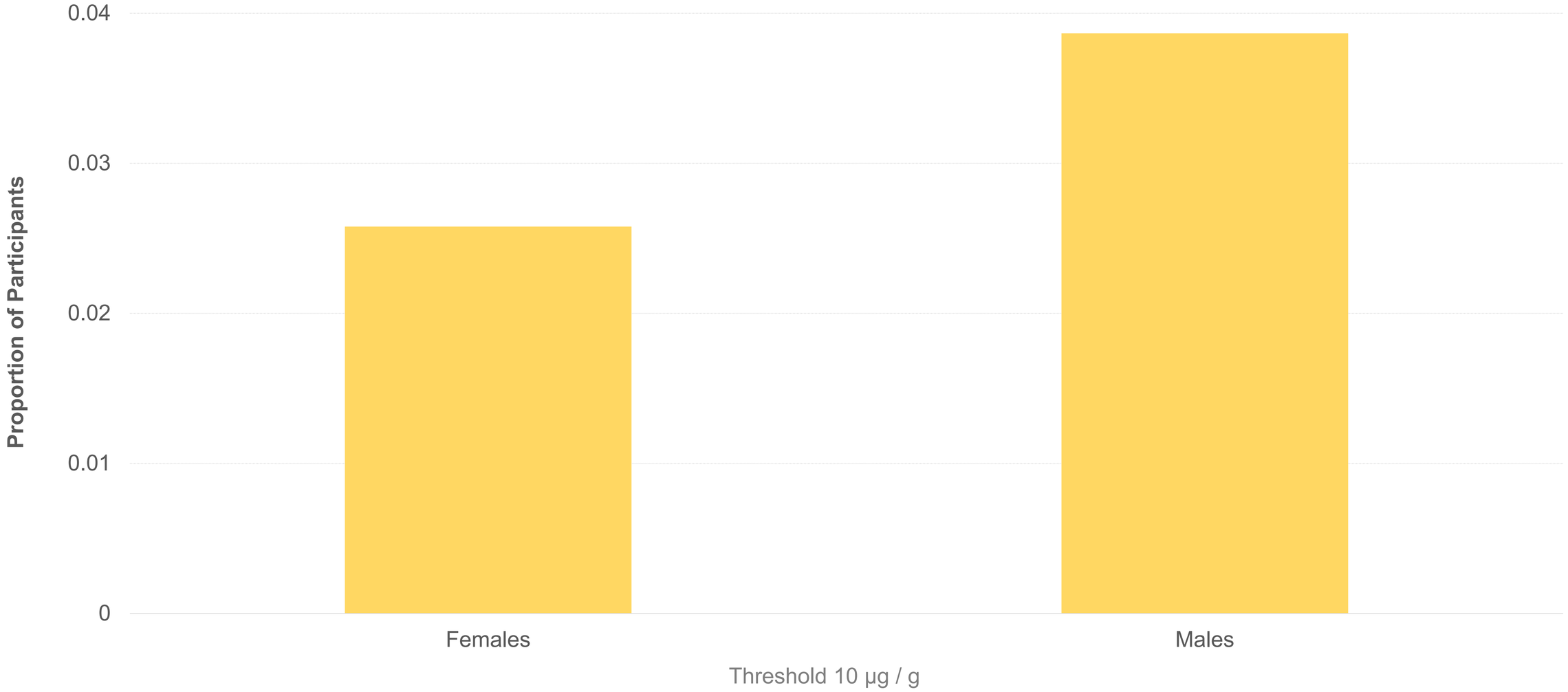


# FIT-screening: Yield by Sex



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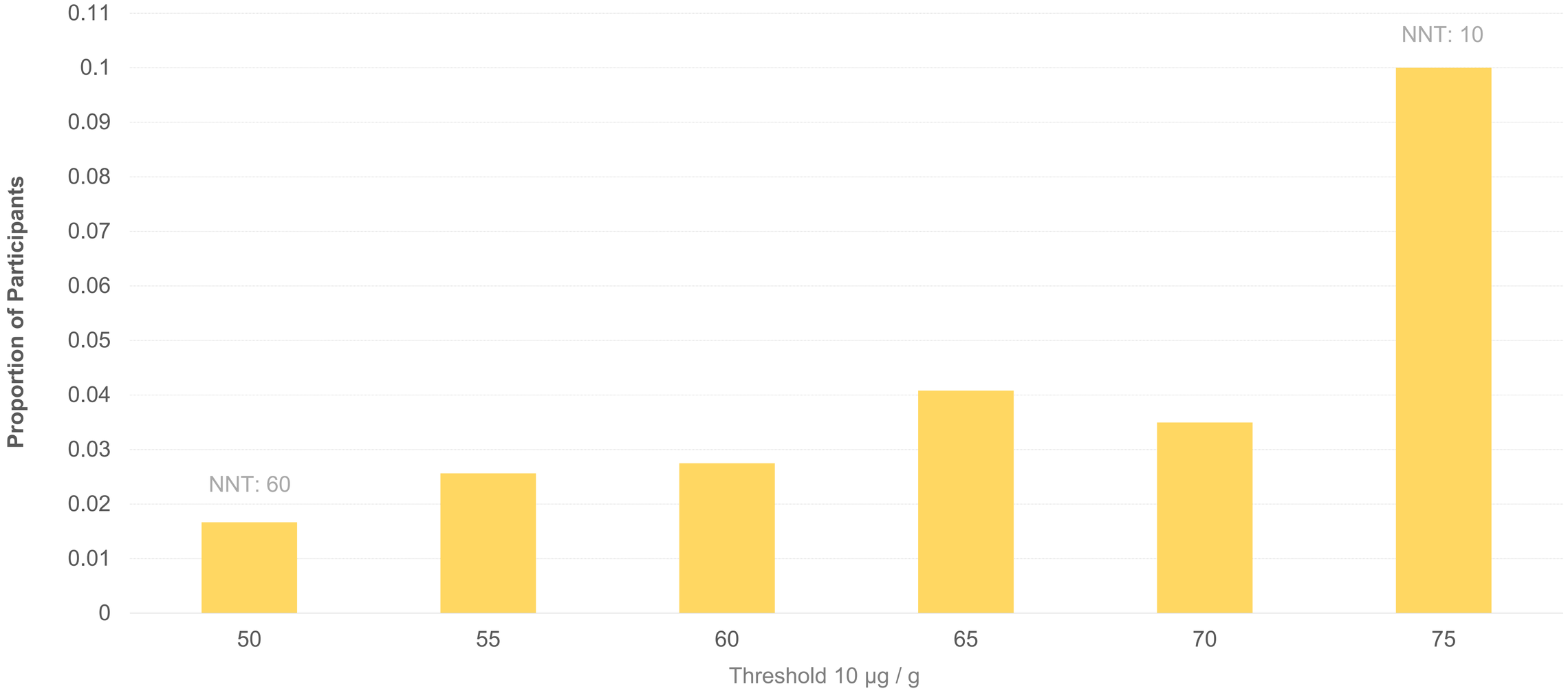


# We observe differences by Age and Sex

- ... in risk of having advanced neoplasia
- ... in distribution of FIT results

- ... in FIT positivity (proportion positives)
- ... in FIT sensitivity and specificity
- ... in FIT positive predictive value (positive colonoscopies)
- ... in yield of FIT-based screening (adv neoplasia detected)
- ... in total number of life years gained by FIT-based screening

# Equity? Efficiency?

- ... in risk of having advanced neoplasia
- ... in distribution of FIT results

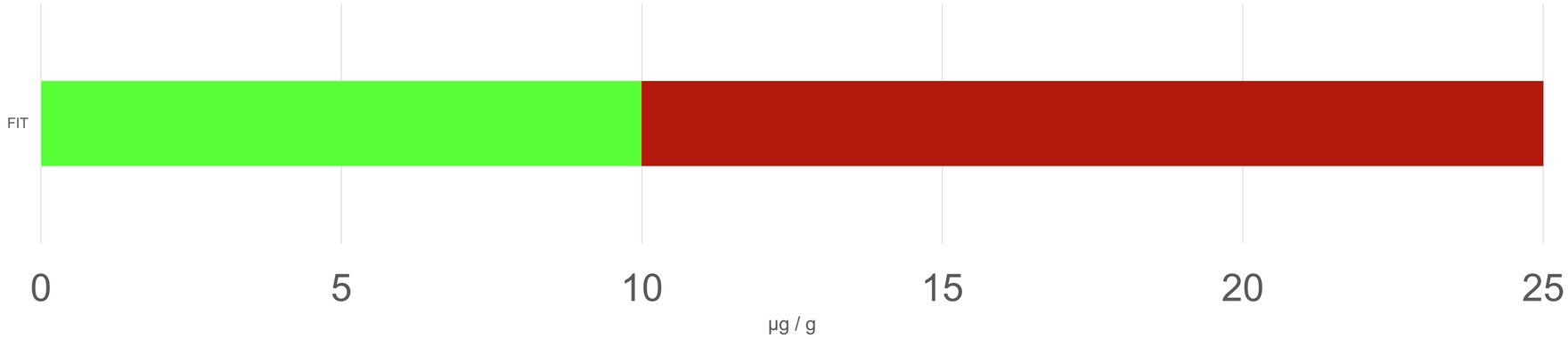
- ... in FIT positivity (proportion positives)
- ... in FIT sensitivity and specificity
- ... in FIT positive predictive value (positive colonoscopies)
- ... in yield of FIT-based screening (adv neoplasia detected)
- ... in total number of life years gained by FIT-based screening

# We can change FIT performance…

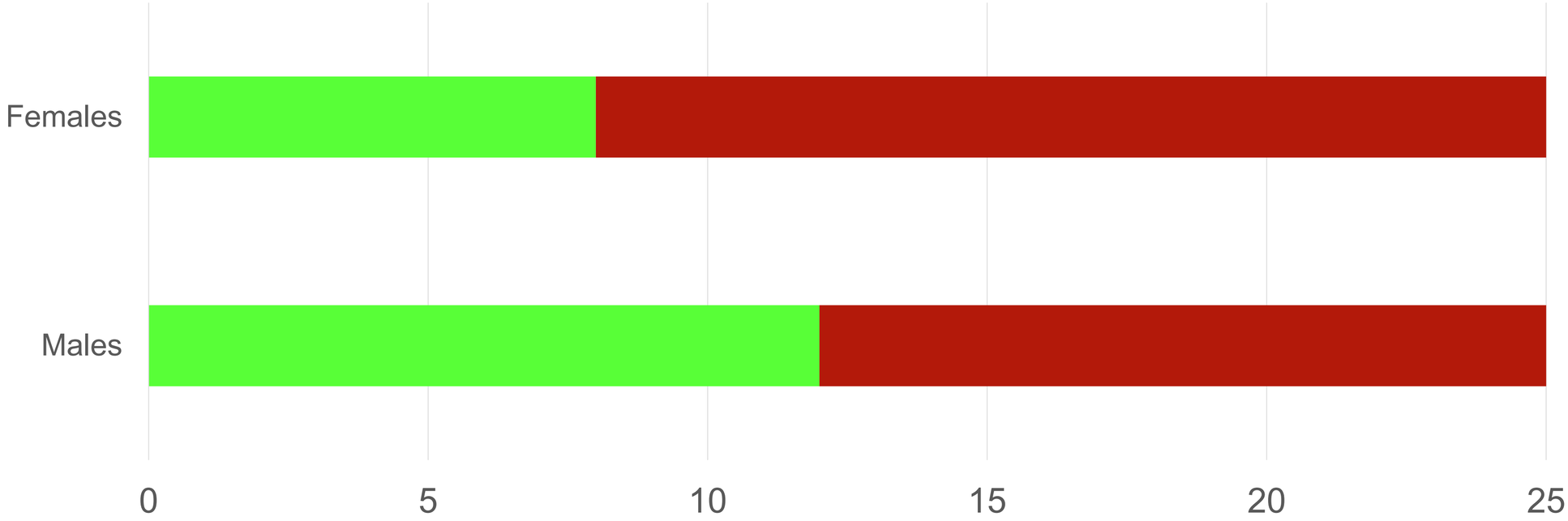
- ... in risk of having advanced neoplasia
- ... in distribution of FIT results

- ... in FIT positivity (proportion positives)
- ... in FIT sensitivity and specificity
- ... in FIT positive predictive value (positive colonoscopies)
- ... in yield of FIT-based screening (adv neoplasia detected)
- ... in total number of life years gained by FIT-based screening

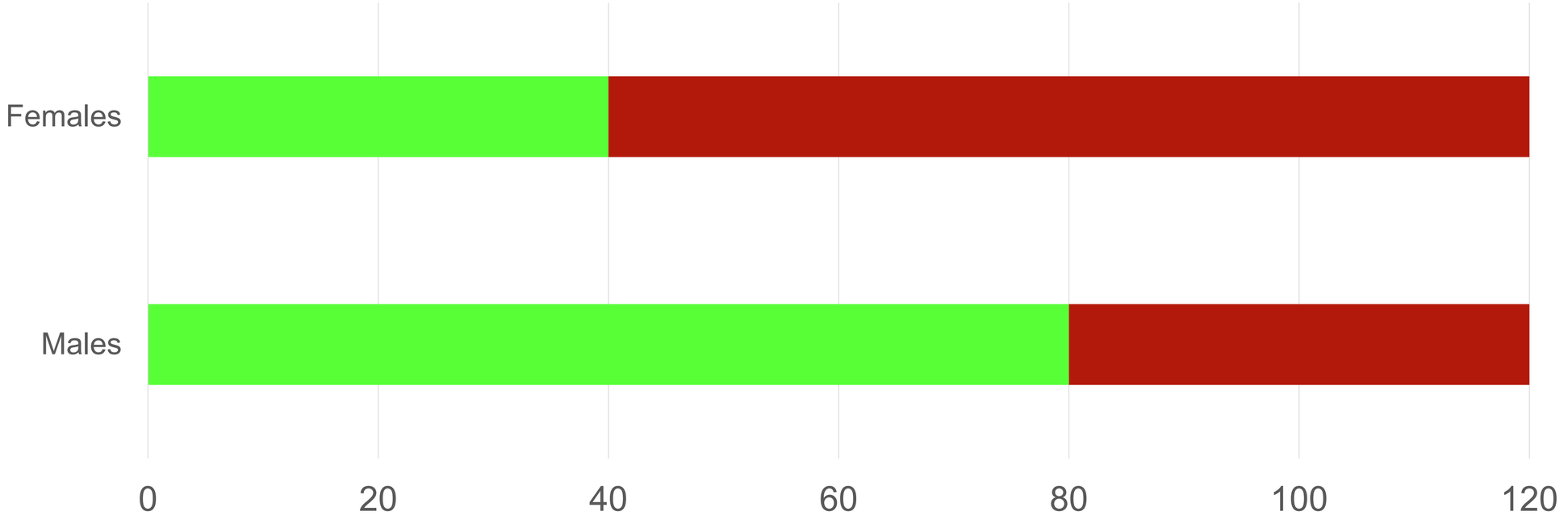
# FIT: Single Positivity Threshold



# FIT: Different Positivity Thresholds



# FIT: Equity in Positives



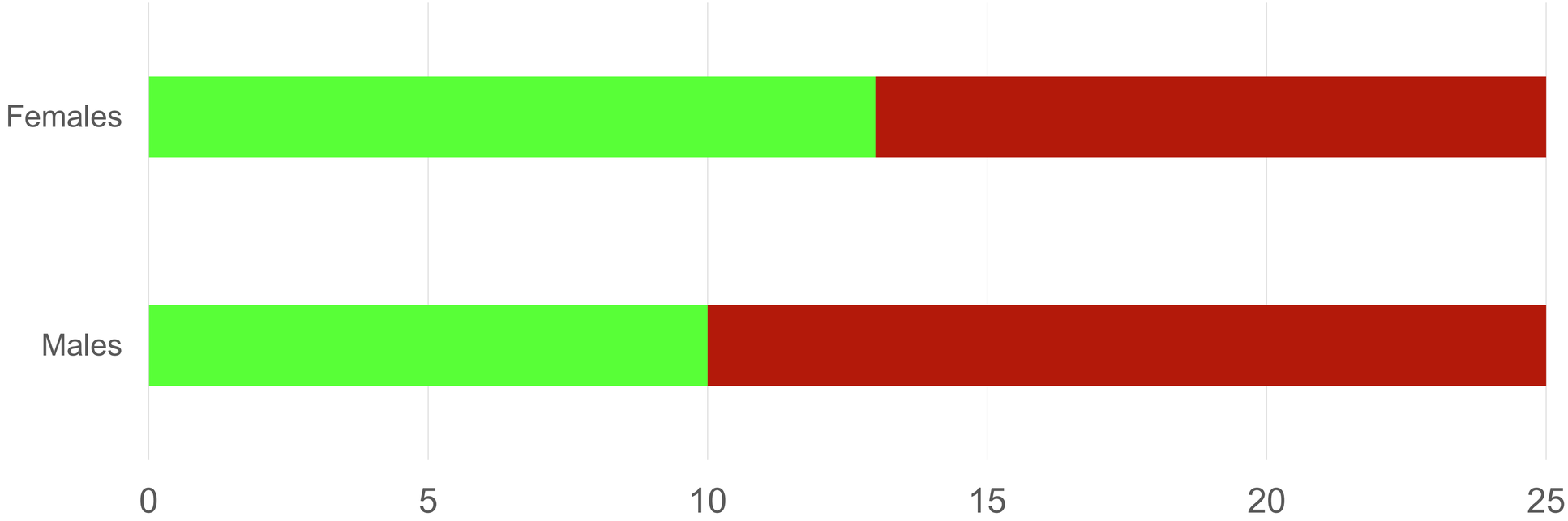

**Gender-specific cut-offs in colorectal cancer screening with FIT: Increased compliance and equal positivity rate**

*J Med Screen*
0(0) 1–6

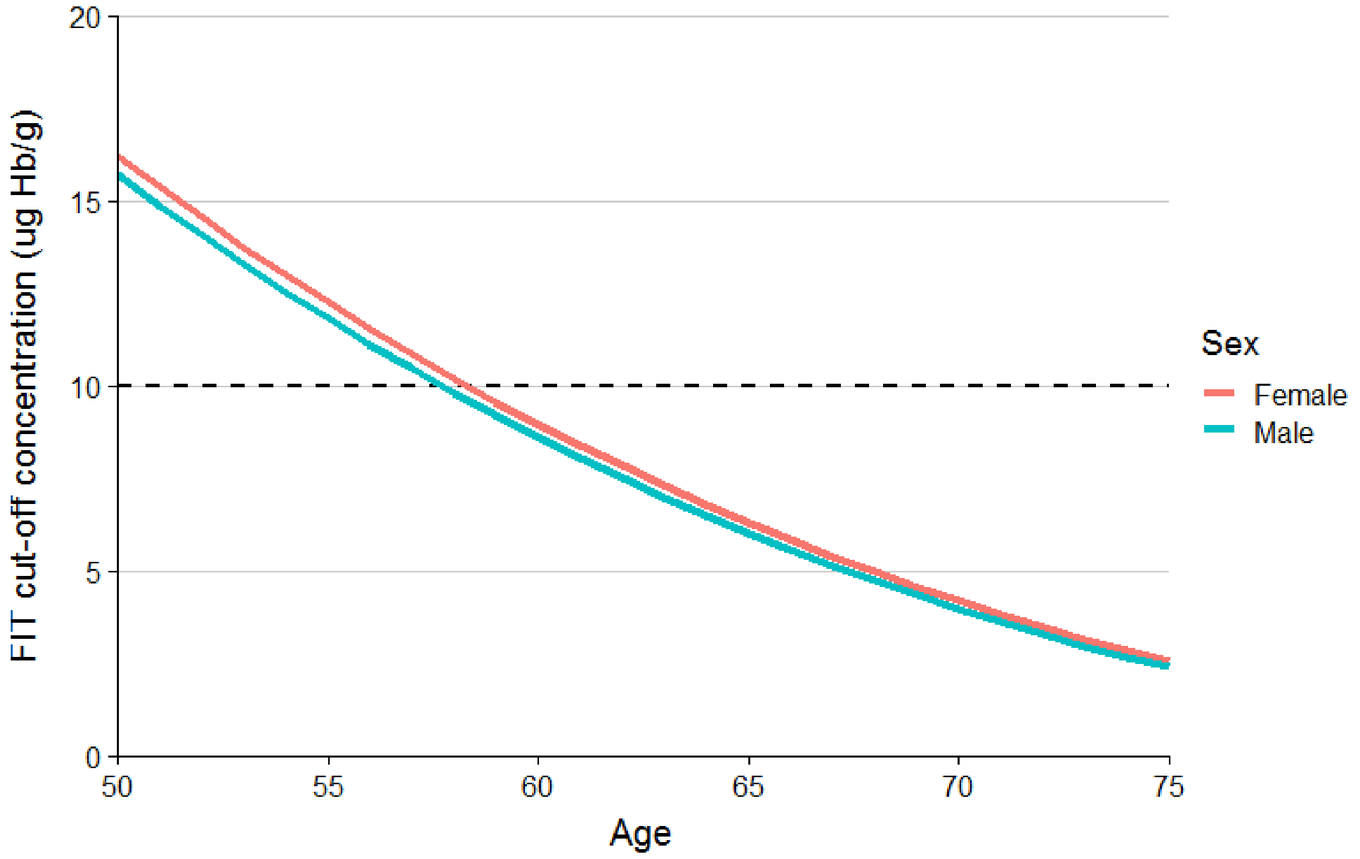
DOI: 10.1177/0969141318804843
journals.sagepub.com/home/msc
SAGE

Johannes Blom[1,2], Christian Löwbeer[3,4], K. Miriam Elfström[2,5], Marika Sventelius[2], Daniel Öhman[2], Deborah Saraste[1] and Sven Törnberg[2,6]

# FIT: Equity in Positive Predictive Value



# Example: Equity in Positive Predictive Value




*Combinations of Age and FIT threshold to yield similar positive predictive values*

**Individualized Faecal Immunochemical Test Cut-off based on Age and Sex in Colorectal Cancer Screening**

Tim L. Kortlever[a], Manon van der Vlugt[a], Evelien Dekker[a], Patrick M.M. Bossuyt[b]

*submitted*

# Which differences should be reduced first?

- ... in risk of having advanced neoplasia
- ... in distribution of FIT results

- ... in FIT positivity (proportion positives)
- ... in FIT sensitivity and specificity
- ... in FIT positive predictive value (positive colonoscopies)
- ... in yield of FIT-based screening (adv neoplasia detected)
- ... in total number of life years gained by FIT-based screening

# Which differences should be reduced first?

[Zoom Poll]

# Equity in Positive Predictive Value

- Ethics: comparable Benefit / Burden balance when undergoing colonoscopy
- Efficiency: comparable number needed to scope (colonoscopy resources)
- Can be objectified  (e.g. logistic regression modeling)

# Challenges

- Have to consider differential participation
- Have to consider differential colonoscopy acceptation
- Have to consider multiple rounds
- More complex = More errors?
- Acceptability?

# Key Messages:

- Most FIT-based screening programs use a single FIT positivity threshold.
- But CRC risk and FIT results vary
  with sex and age.
- This leads to differences
  by sex and age
  in FIT performance and screening yield
- Using different FIT positivity thresholds,
  based on sex and age,
  could reduce differences and
  restore equity and efficiency.


ONE SIZE DOES
NOT FIT ALL
€£$

WEO

The voice of world endoscopy

# Incorporating demographic information

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