



Public meeting will begin momentarily

- This meeting is being recorded
- Captions are available by clicking the CC icon in the Zoom toolbar below
- ASL is provided
- Presentation materials are available in the news article on the Board's News page:
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U.S. Access Board

**Medical Diagnostic
Equipment:
Low Transfer Height**

**Public Information Meeting
May 12, 2022**



**Sachin Dev
Pavithran, Ph.D.**
Executive Director
U.S. Access Board



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Accessibility Specialist
U.S. Access Board

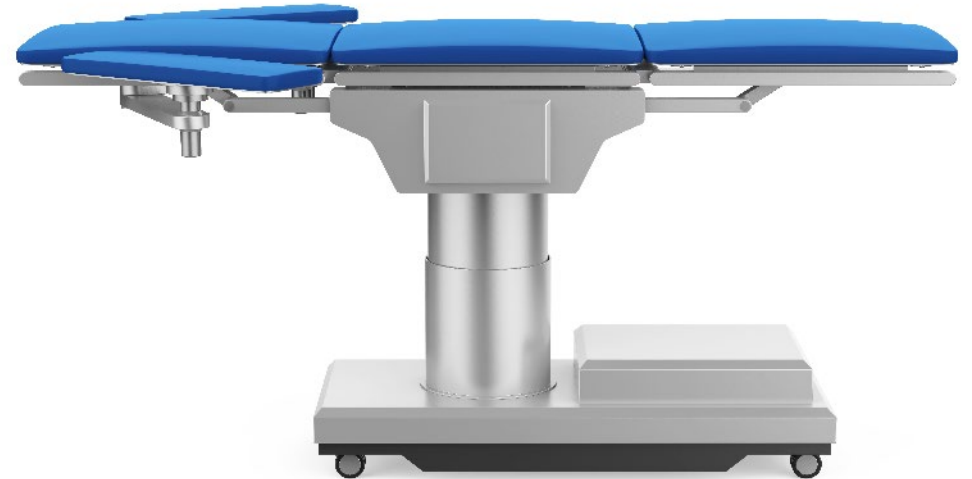
Background

- ***Section 510 of the Rehabilitation Act*** charges the Access Board with developing and maintaining accessibility standards for medical equipment used by health care providers for diagnostic purposes.
- In 2017, the Access Board issued **Medical Diagnostic Equipment (MDE) standards** establishing minimum technical criteria to ensure that medical diagnostic equipment in physician's offices, clinics, emergency rooms, hospitals, and other medical settings is independently accessible to, and usable by, individuals with disabilities.

Background Continued...

Among other specifications, Medical Diagnostic Equipment Standards address:

- the height and adjustability of MDE equipment that patients who use wheelchairs must transfer onto, including examination tables and chairs, procedure tables, and imaging equipment with tables.



Rulemaking on Medical Diagnostic Equipment Standards

Final Report
Anthropometry of Wheeled Mobility Project



Prepared for the U.S. Access Board

December 31st, 2010

Center for Inclusive Design and Environmental Access (IDeA)

School of Architecture and Planning

University at Buffalo

The State University of New York

Buffalo, NY 14214-308

December 2010 – Final Report: The Anthropometry of Wheeled Mobility Project collected anthropometric data on 495 people who use wheeled mobility devices in the United States *conducted by the University of Buffalo Center for Inclusive Design and Environmental Access (IDeA Center).*

Researchers measured wheelchair seat height, occupied length, turning radii, reach ranges, and other dimensions.

Finding: occupied seat heights for people who use wheeled mobility devices vary considerably.

Notice of Proposed Rulemaking for MDE Standards

- February 2012: the Access Board sought public comment on whether the height of transfer surfaces should be adjustable within a range of 17 inches minimum and 25 inches maximum.
- July 2012: the Access Board organized an advisory committee representing stakeholders to provide recommendations on how the MDE Standards should be finalized based on the public comments received.
- Most commenters supported a requirement for adjustability and a high transfer surface height of 25 inches but a consensus was not reached on what the low transfer height should be.

Medical Diagnostic Equipment Final Rule

January 2017 – Access Board issued a final rule:

- Transfer surfaces to be adjustable 17–19 to 25 inches
- Four unspecified heights between the high and low
- Approach taken due to insufficient information on low transfer height
- Five Year Sunset provision extended to January 2025

Further Research

In 2021, the Access Board commissioned a secondary analysis of the Anthropometry of Wheeled Mobility database.

- Analysis was undertaken because some segments of the population test sample were over- or under-represented.
- Researchers statistically resampled the data.



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Goals of the AWM Project

- Develop reliable and accurate methods for measuring the anthropometry of wheeled mobility users.
- Collect anthropometric data on a large sample of contemporary wheeled mobility users, especially users of powerchairs and scooters.
- Develop a database that can serve as a foundation for a long-range research program.
- Develop design tools and recommendations for use in technical assistance and design.



Data collection methods

Structural measurements



Reach measurements



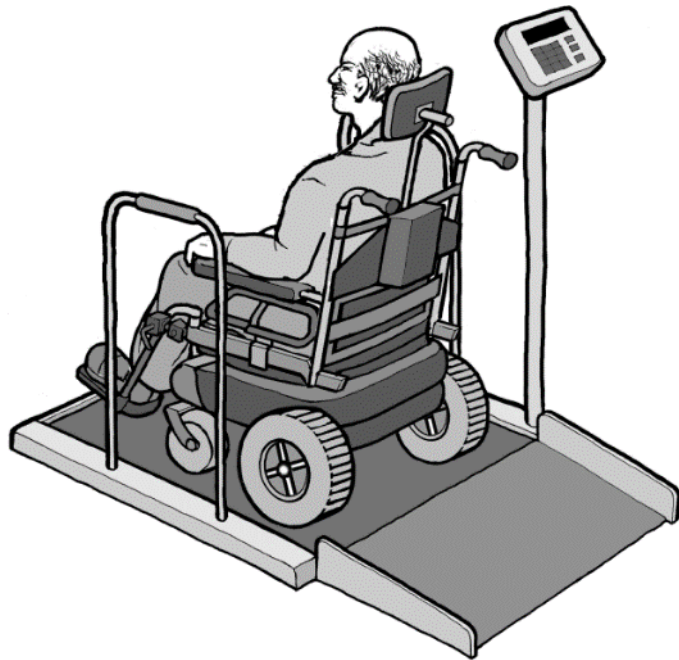
Study Sample

- 500 wheeled mobility device users
 - 264 (53%) men, 236 (47%) women
 - 277 (55%) manual chair, 189 (38%) power chair, 34 (7%) scooter users
- Used a wheeled mobility device as the primary means of mobility
- Diverse medical conditions: spinal cord injuries, cerebral palsy, multiple sclerosis, stroke, amputations, etc.
- Study locations: Greater Buffalo Area-NY, Ithaca-NY, Pittsburgh-PA

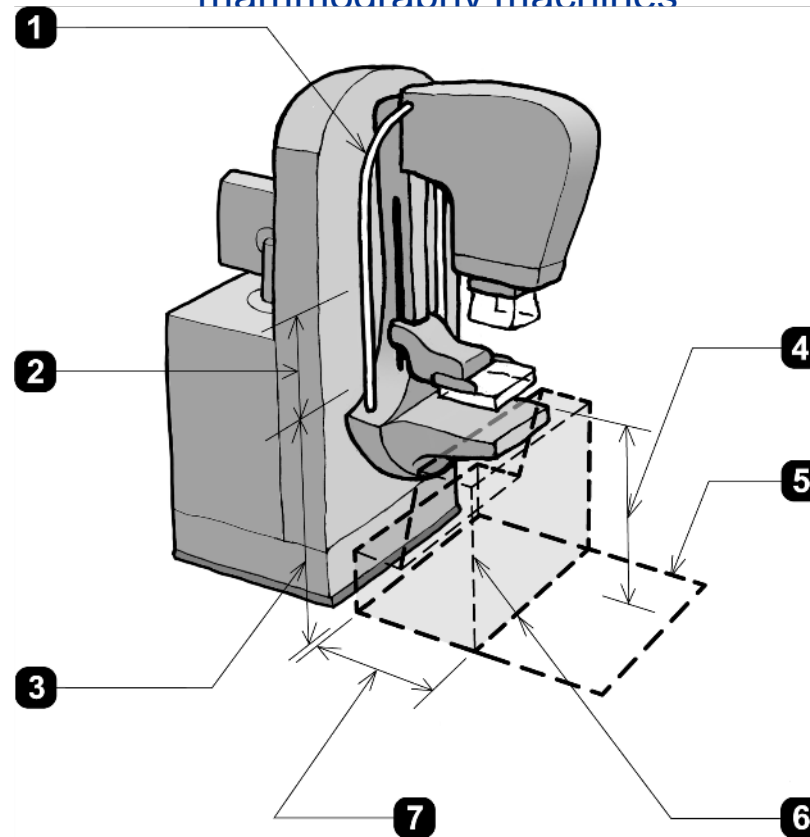


Standards for Accessible Medical Diagnostic Equipment

Device dimensions for sizing weight scales



Knee-toe clearances and chest height for mammography machines

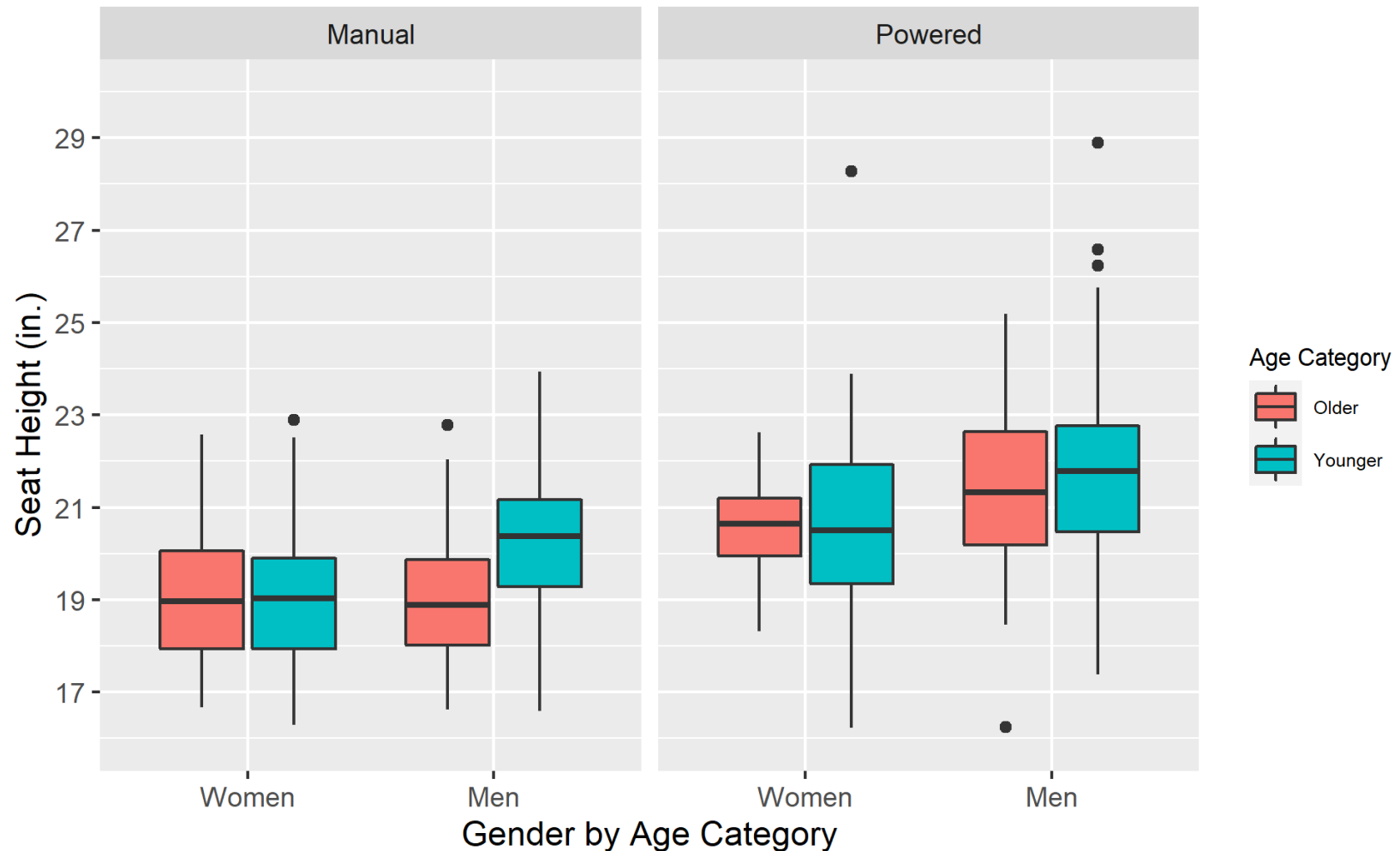


Occupied seat height ranges for side transfers



Occupied Seat Heights

- Distribution of occupied seat heights in the original IDeA Center AWM dataset
- Diverse seat heights between and within manual and powered wheelchairs (n = 466)



Demographic Proportions: Study Sample vs. National Estimates

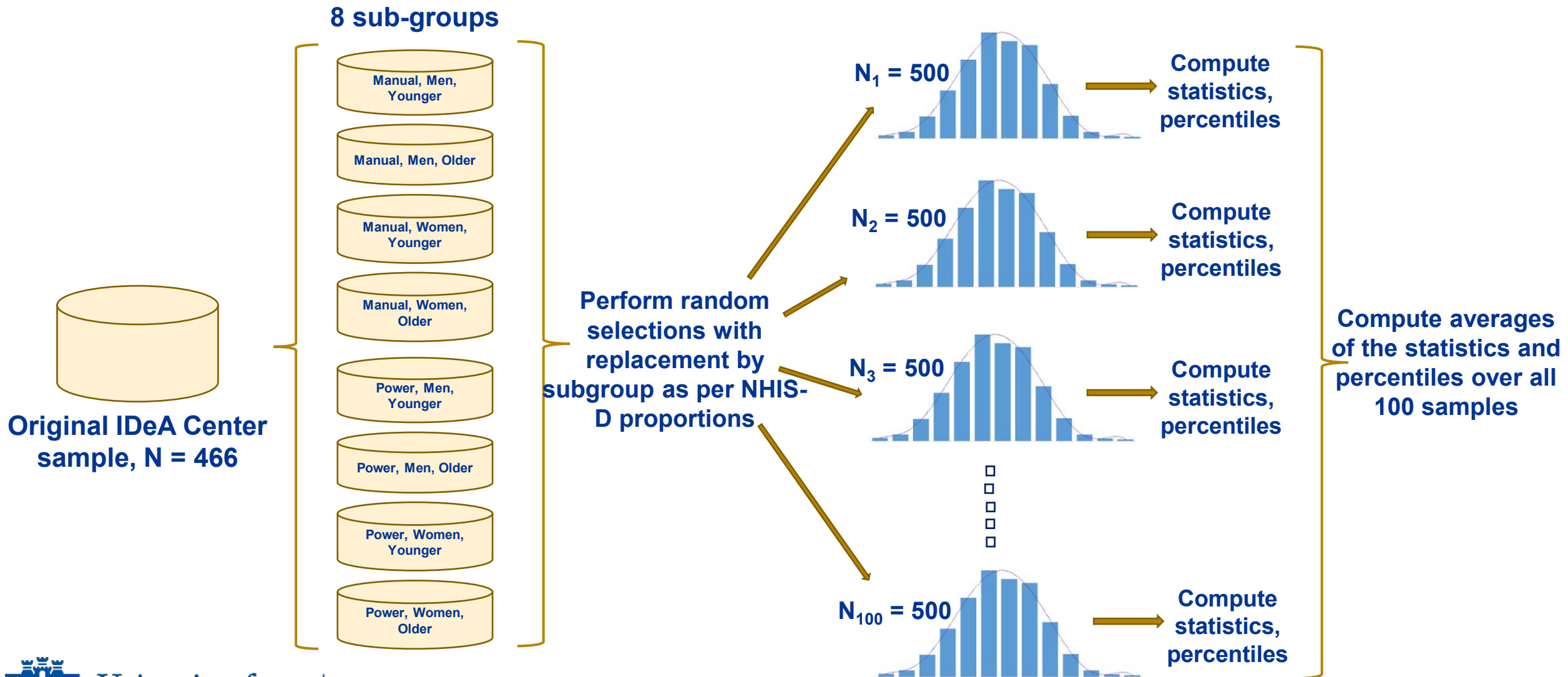
Note: These proportions intentionally exclude scooter users.

		IDeA Center Study Sample (original)			1994-97 NHIS-D Proportions (target)		
Age	Gender	Manual	Powered	Total	Manual	Powered	Total
18-64	Men	23.0	16.7	39.7	17.6	2.8	20.5
	Women	13.3	12.4	25.8	18.6	3.0	21.6
65+	Men	8.6	4.7	13.3	18.8	1.0	19.8
	Women	14.6	6.7	21.2	36.1	2.0	38.1
Total %		59.4	40.6	100.0	91.1	8.8	100.0

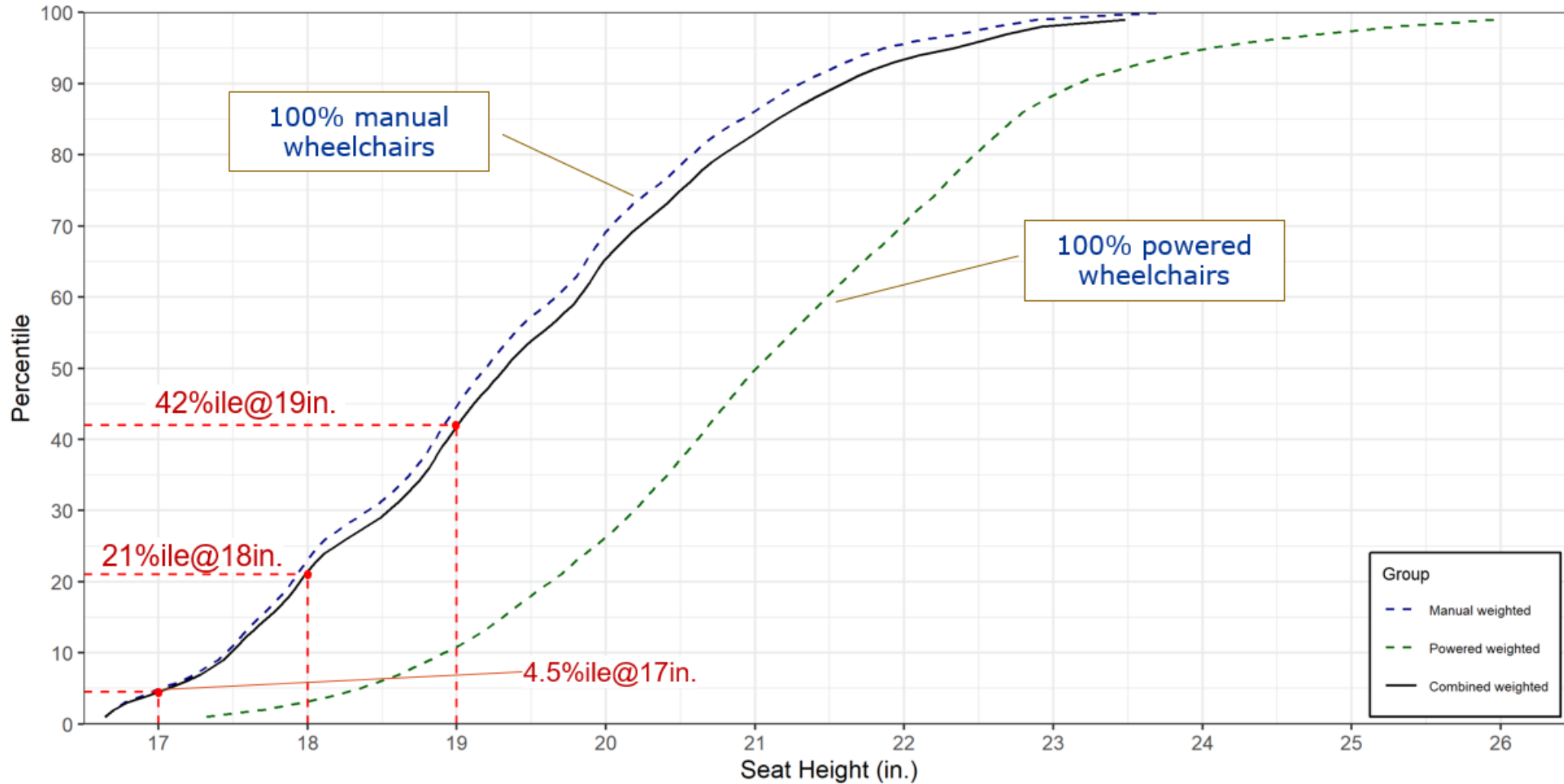
A deliberate oversampling of powered wheelchair users in the IDeA Center study



Overview of the Resampling Methodology



Percentile Plot: Proportionally Weighted Seat Heights



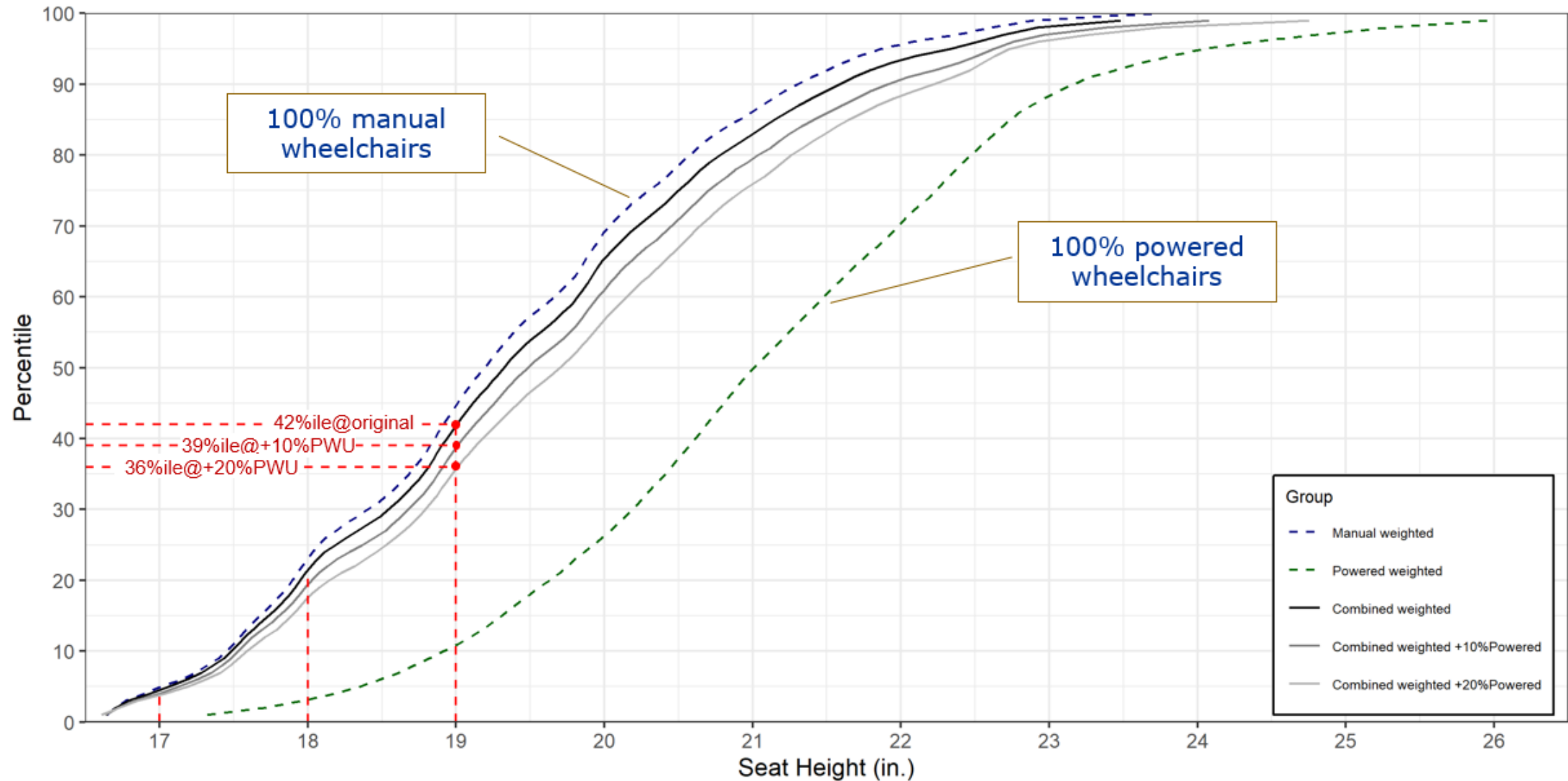
Exploring Changes in Demographic Proportions

What if the percentage of powered wheelchair use has increased by 10% or 20%?

		1994-97 NHIS-D Proportions			+10% Powered Wheelchairs			+20% Powered Wheelchairs		
Age	Gender	Manual	Powered	Total	Manual	Powered	Total	Manual	Powered	Total
18-64	Men	17.6	2.8	20.5	15.1	5.3	20.5	12.6	7.8	20.5
	Women	18.6	3.0	21.6	16.1	5.5	21.6	13.6	8.0	21.6
65+	Men	18.8	1.0	19.8	16.3	3.5	19.8	13.8	6.0	19.8
	Women	36.1	2.0	38.1	33.6	4.5	38.1	31.1	7.0	38.1
Total %		91.1	8.8	100.0	81.1	18.8	100.0	71.1	28.8	100.0



Percentile Plot: Increase in Powered Wheelchair %



Conclusion

- Statistical resampling was used to generate proportionally representative samples.
- Estimated the proportion of wheelchair users with seat height $\leq 17''$, $18''$ and $19''$
 - If the lower height limit of MDE transfer surfaces were set to $17''$, $18''$, or $19''$, then the proportion of wheelchair users excluded is estimated to be no more than 4.5%, 21%, and 42%, respectively.
 - Due to the small proportion of powered wheelchairs in the 1994-97 NHIS-D survey, percentiles for the combined proportional sample were similar to percentiles for manual wheelchairs.
- Statistical resampling allowed for estimating the potential influence of increasing powered wheelchair proportions
 - at $19''$, a 10% increase in powered wheelchairs decreased the percent excluded from 42% to 39%
 - at $17''$, a 10% increase in powered wheelchairs decreased the percent excluded from 4.5% to 4%
- Setting design specifications near the lower end of the distribution (e.g., $17''$ or $17.5''$) would be less affected (more robust) to future changes in population demographics.



References

- Analysis of Low Wheelchair Seat Heights and Transfer Surfaces for Medical Diagnostic Equipment: Final Report
 - <https://www.access-board.gov/research/human/wheelchair-seat-height/>
- Anthropometry of Wheeled Mobility Project: Final Report prepared for the U.S. Access Board
 - <http://idea.ap.buffalo.edu/projects/anthropometry/>



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Thank you!

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Questions about the Study

**You may type and submit
questions in the Q&A
Area**

Request for Information

The Access Board is particularly interested in:

- The low height of adjustable MDE products currently on the market.
- Changes or innovations in the design and engineering of MDE that may have occurred since the Board issued standards in 2017.
- Updated information on the incremental costs for the design or redesign and manufacture of MDE that can provide a low transfer height of 17 inches.

Public Comments

- Request to share information, ideas, or comments using Zoom's Q & A feature:
 - Name (and organization)
 - Brief description of content
- Host will enter you into queue
- Moderator will announce when you should unmute (*6 by phone)
- Moderator will also announce next in que
- Presenters may respond to some comments
- Alternative: events@access-board.gov
- ASL – note in request to comment
- Please limit comments to < 3 min.



Written Comments

- Comments may be submitted until May 27, 2022.
- Submit written comments via email to:
mde@access-board.gov



Further Information

U.S. Access Board
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www.access-board.gov
(800) 872-2253 (voice)
(800) 993-2822 (TTY)

Thank you for joining us today.

**This concludes our event. This event
has been recorded, and the recording
will be available on the Access Board's
homepage and its YouTube Channel
soon.**

