Analysis of the survey regarding software tools for positioning and personalizing human body models

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1 Introduction

1.1 Why you got this survey

On November 2013 a EU funded project started with the aim of devoloping a (open-source) software tool to position FE human body models as well as a (open-source) software tool to personalize (scale) FE human body models. The positioning tool is intended to change the posture of a human body model. The personalization tool is intended to change the size and shape of a human body model. The tools are aimed to be model and code independent as far as possible. In addition to these software tools available child models will be improved in a way that they can be used in conjunction with the above mentioned software tools. More information about the PIPER project can be found on the project website www.piper-project.eu. The PIPER project consortium wants to make sure that the software tools as well as the child model that will be developed in the project meets the requirements of the intended users. This questionaire will identify the needs of the users. That is why we would like to ask you to fill out this questionaire. This survey should only take about 10 minutes of your time.

1.2 How to fill out the survey

Most of the questions can be answered by simple marking the predefined answer that reflects your prefered answer. Only one answer per question is possible if more than one answer are allowed it will be indicated. At some questions your writen answer is needed, please keep your answer as short as possible. If you don't know the answer just skip the question without answering it. As already explained above you have to fill out the survey at once, there is no chance to stop (leave the website) and resume. If for some reason you need to stop answering the questions before you reached the end of the questionaire don't send the incomplete survey but just close the webside. You can start from the beginning at any later date. But please keep in mind that the survey will be closed at the end of next month.

1.3 Privacy policy

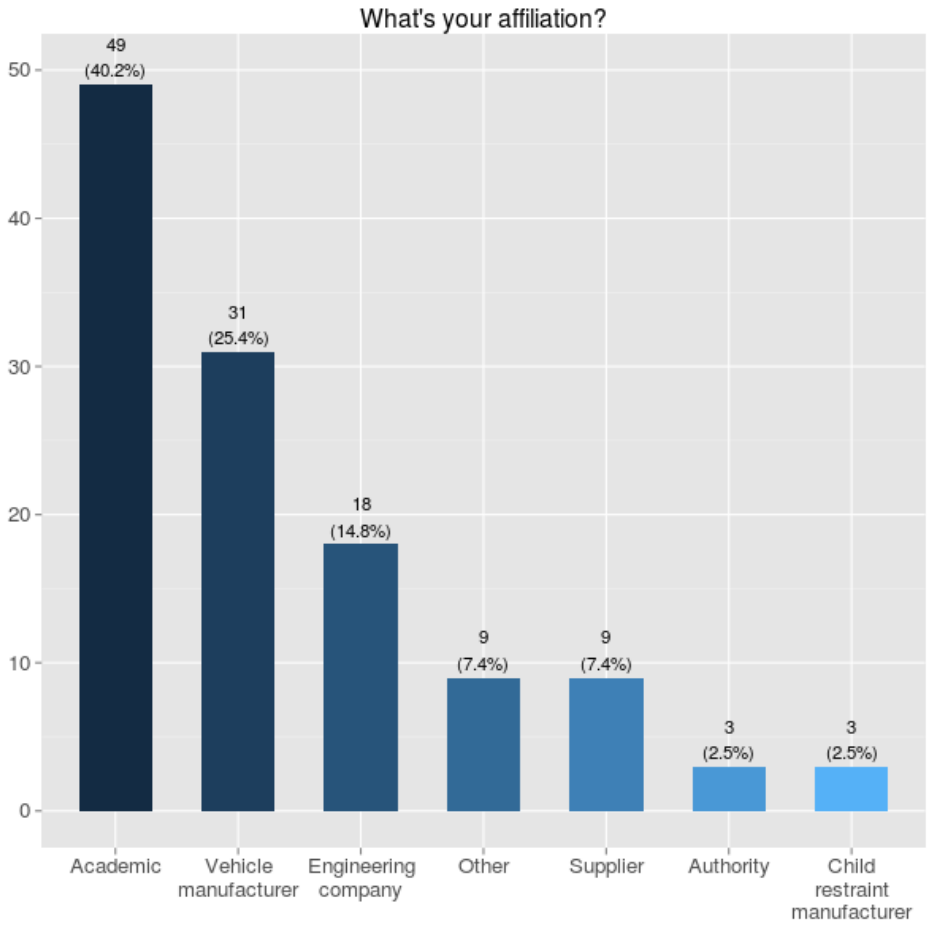
We don't collect or track any personal data from you, consequently we don't know who you are - you will be completely anonymous. As a result we can't link your answers to your person and hence you can't stop and resume answering the survey. You have to fill out the survey at once. In addition we can't send you the result of the survey evaluation because we don't keep track of your email address. The results of the survey will be published on the PIPER project website www.piper-project.eu in about 2 month from now.

2 General questions

2.1 What's your affiliation?

Choose one of the following answers
[ ] Vehicle manufacturer
[ ] Engineering company
[ ] Supplier
[ ] Child restraint manufacturer
[ ] Authority
[ ] Academic
[ ] Other: […..]
[ ] No answer
In doubt state your main affiliation

2.1.1 Results



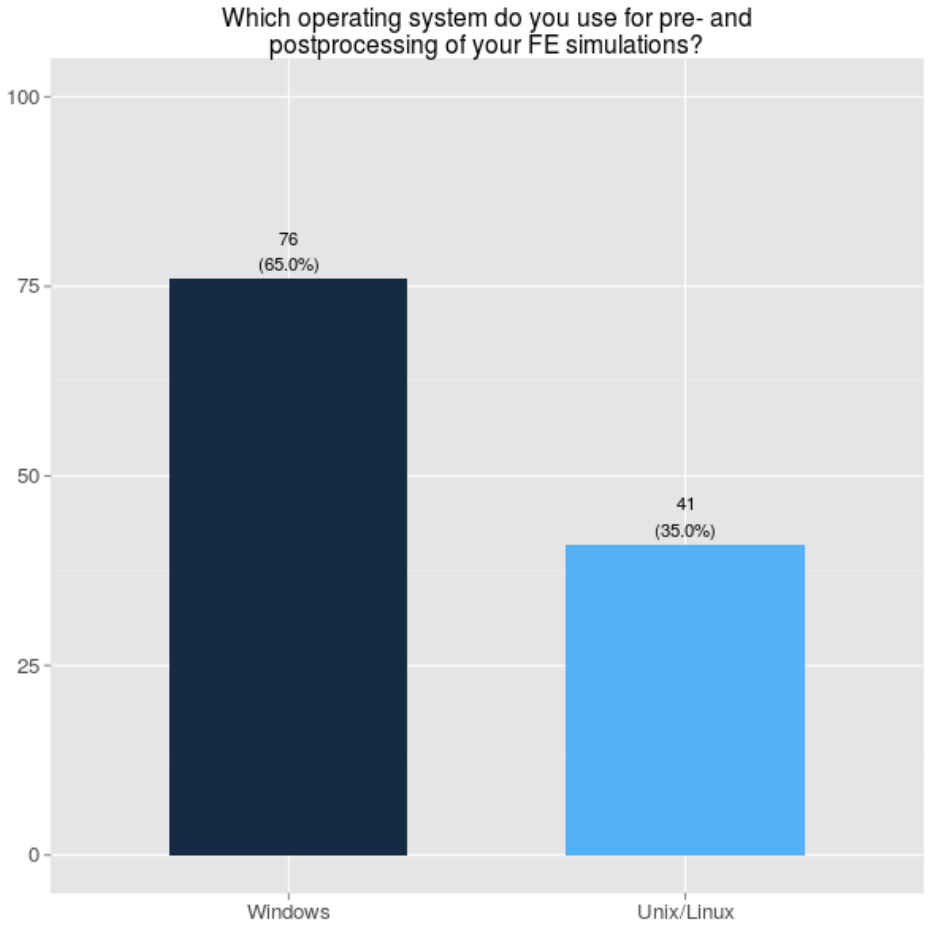
Other affiliations:

```
Software supplier, Research Organisation, Railway manufacturer,
Research Center, Engineer-Inventor, helmet manufacturer,
Half academic, half industry, protetective equipment manufacturer,
Research Foundation
```

2.2 Which operating system do you use for pre- and postprocessing of your FE simulations?

Choose one of the following answers
[ ] Windows
[ ] MacOS
[ ] Unix/Linux
[ ] Other: […..]
[ ] No answer
If you use more than one OS, please choose the one you use the most

2.2.1 Results

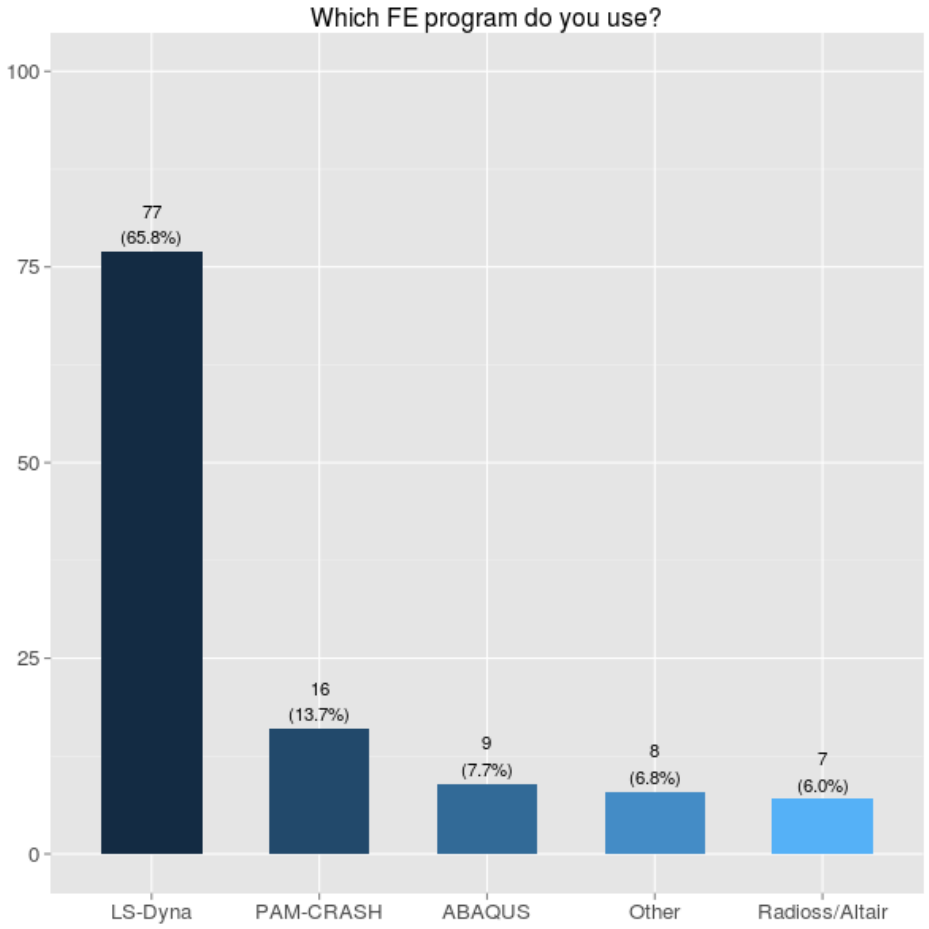


Other Operating systems:

2.3 Which FE program do you use?

Choose one of the following answers
[ ] PAM-CRASH
[ ] LS-Dyna
[ ] ABAQUS
[ ] Radioss/Altair
[ ] Other: […..]
[ ] No answer
If you use more than one FE program, please choose the one you use the most

2.3.1 Results



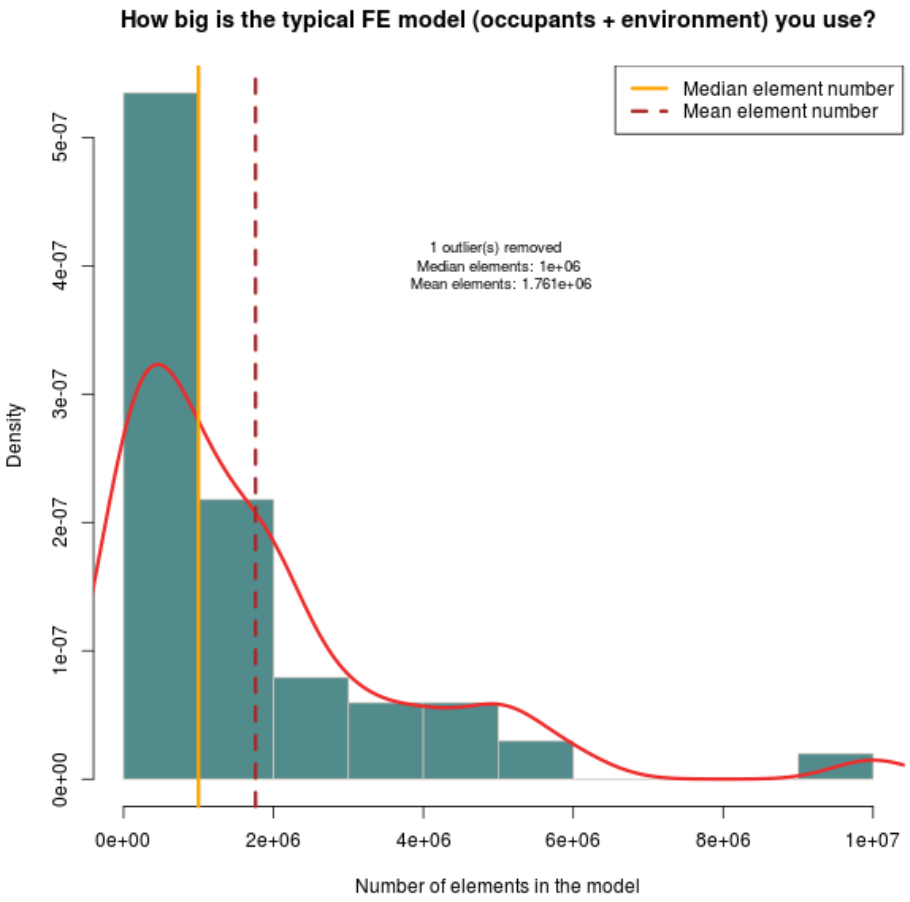
Other FE programs that are used:

```
MADYMO, SUMMIT (MIT research code),
Altair for pre- and postprocessing but the solver that i used is LS-Dyna,
MADYMO, FEBIO, SOFA, MADYMO, Dyna & Pam-crash
```

2.4 How big is the typical FE model (occupants + environment) you use?

Only integer value may be entered in this field.
[…] elements
A rough estimate of the total number of elements in your simulation run is sufficient

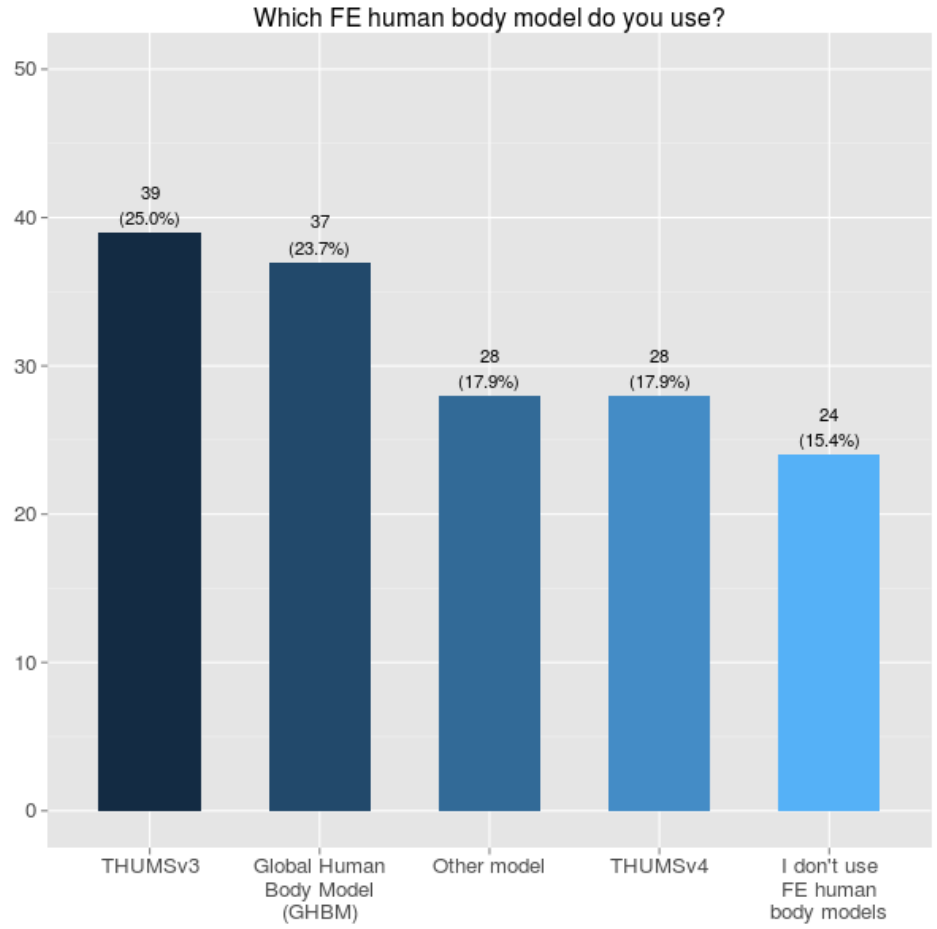
2.4.1 Results



2.5 Which FE human body model do you use?

Check any that apply
[ ] I don't use FE human body models
[ ] Global Human Body Model (GHBM)
[ ] THUMS Version 4
[ ] THUMS Version 3
[ ] Other: […..]

2.5.1 Results



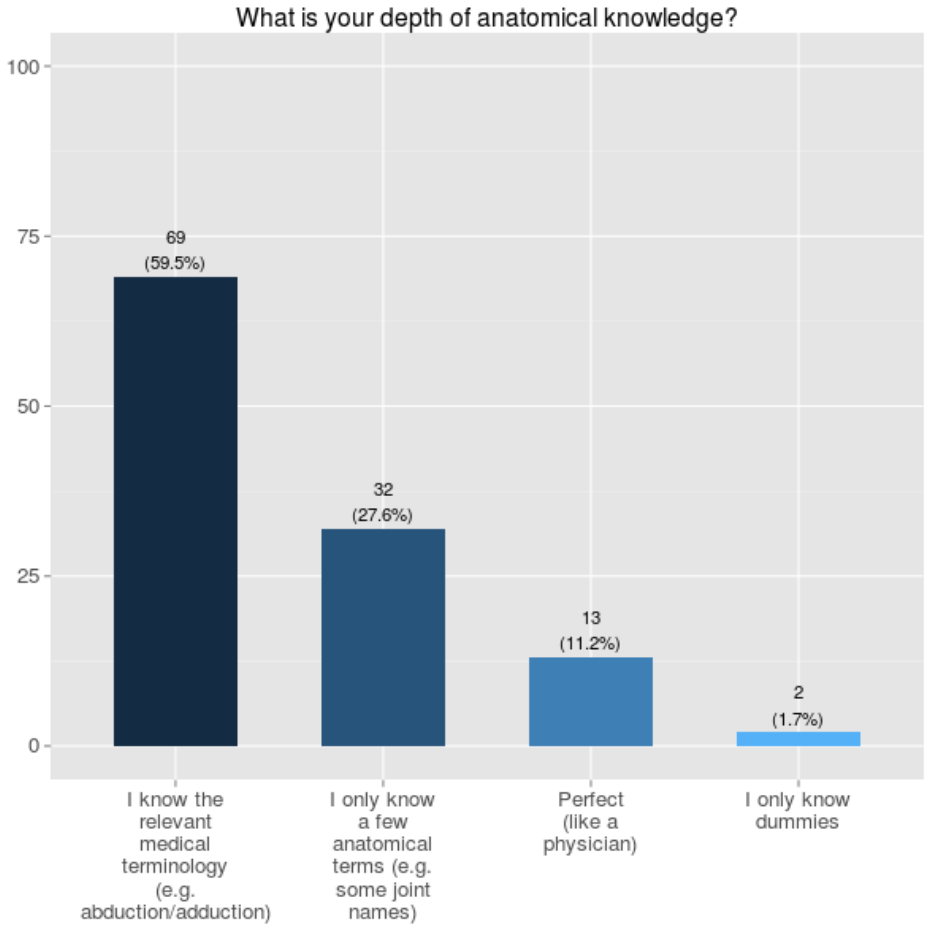
Other models that are used:

```
THUMS V3 modified, Modified THUMS, THUMSD, Daimler Human Body Model, CASIMIR,
Madymo (Active) Human Model, own, MIT FHM,
I don't use FE human bosy models but FE model of anthropometric dummy lik Hybrid III,
Ford HBM, VIRTHUMAN, MADYMO Active Human Model, company's inhouse model,
modified THUMS v3, HUMOS, LLMS, thums 1.4, child,
Daimler Benz adaptation of THUMS, IN-HOUSE, in-house, HBM Models, TKHM,
child models, child models, home-made, Modified version of THUMS Version 3,
Madymo, Home Made
```

2.6 What is your depth of anatomical knowledge?

Choose one of the following answers
[ ] Perfect (like a physician)
[ ] I know the relevant medical terminology (e.g. abduction/adduction)
[ ] I only know a few anatomical terms (e.g. some joint names)
[ ] I only know dummies
[ ] No answer

2.6.1 Results



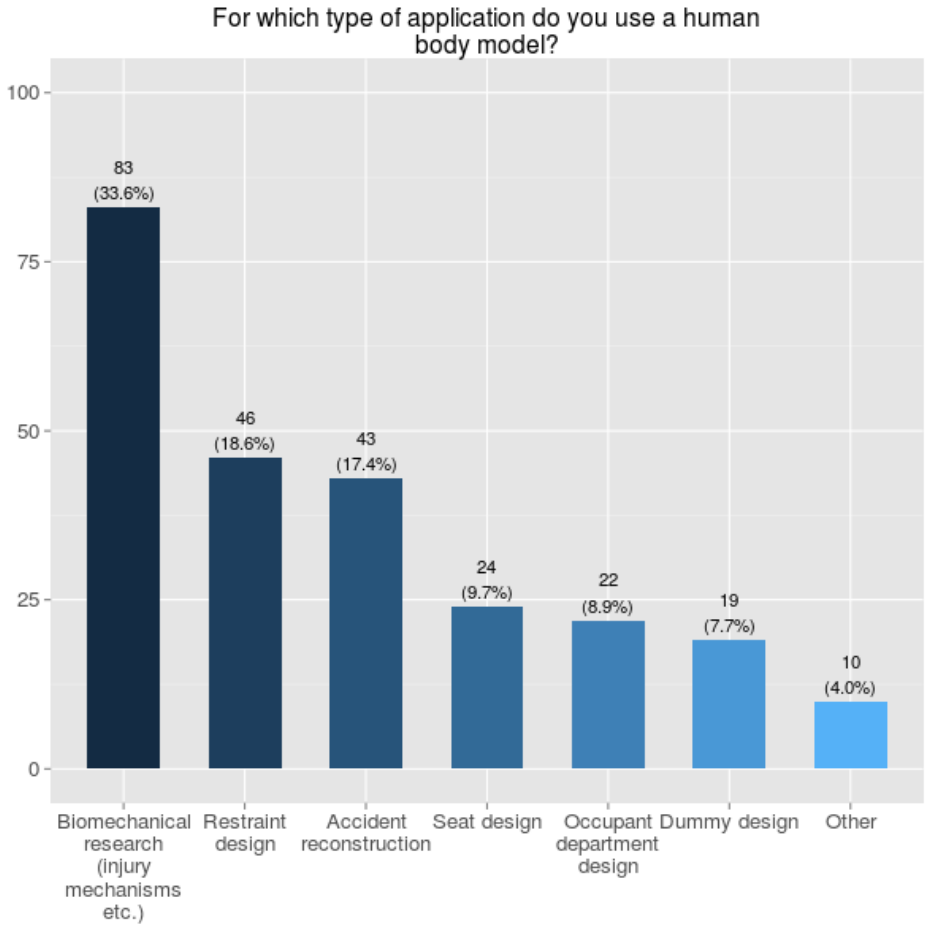
3 Application of human body models

Note: If you currently don't use a human body model please answer the questions as if you would use one.

3.1 For which type of application do you use a human body model?

Check any that apply
[ ] Restraint design
[ ] Seat design
[ ] Occupant department design
[ ] Biomechanical research (injury mechanisms etc.)
[ ] Accident reconstruction
[ ] Dummy design
[ ] Other: […..]

3.1.1 Results



Other applications a human body model is used:

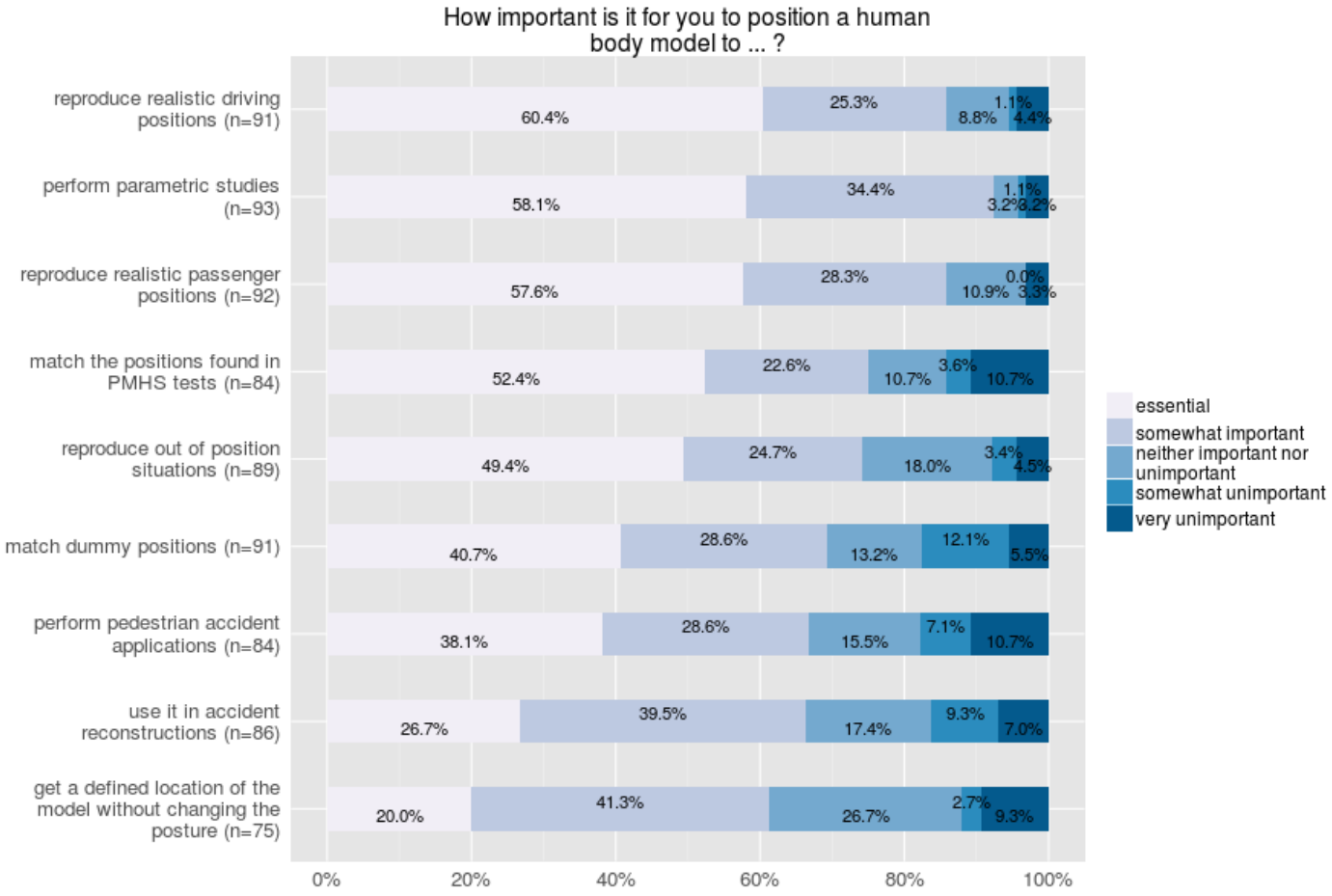
```
Dont use Human body models but use Dummies, PreCrash Phase,
Pedestrian safety design, Software support,
positioning, scaling, tool development, helmet design, Pedestrian Protection,
Occupant compartment design, Pre-crash research,
protective devices for motorcyclists
```

3.2 How important is it for you to position a human body model to … ?

	essential	somewhat important	neither important nor unimportant	somewhat unimportant	very unimportant	No answer
reproduce realistic driving positions						
reproduce realistic passenger positions						
reproduce out of position situations						
use it in accident reconstructions						
match dummy positions						
match the positions found in PMHS tests						
perform parametric studies (analyse the influence of different positions)						
perform pedestrian accident applications						
get a defined location of the model without changing the posture						

The word "position" basically means location and posture of the model

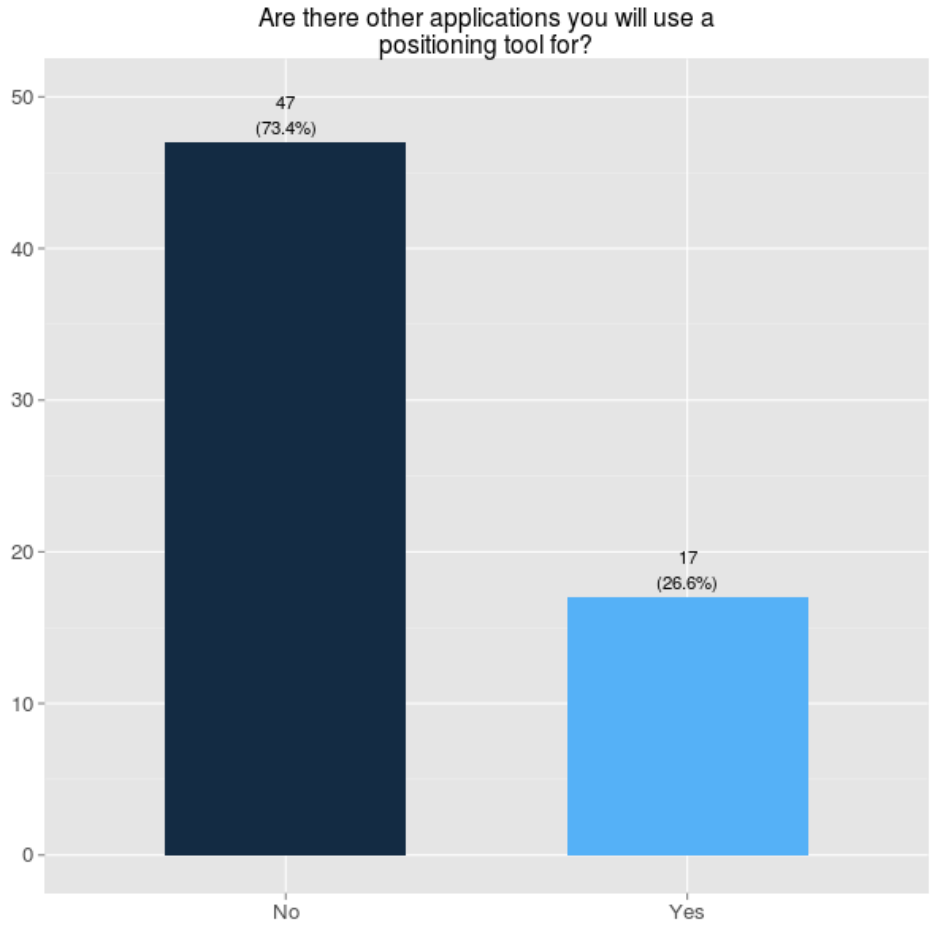
3.2.1 Results



3.3 Are there other applications you will use a positioning tool for?

Choose one of the following answers
[ ] No
[ ] Yes: […..]
[ ] No answer

3.3.1 Results



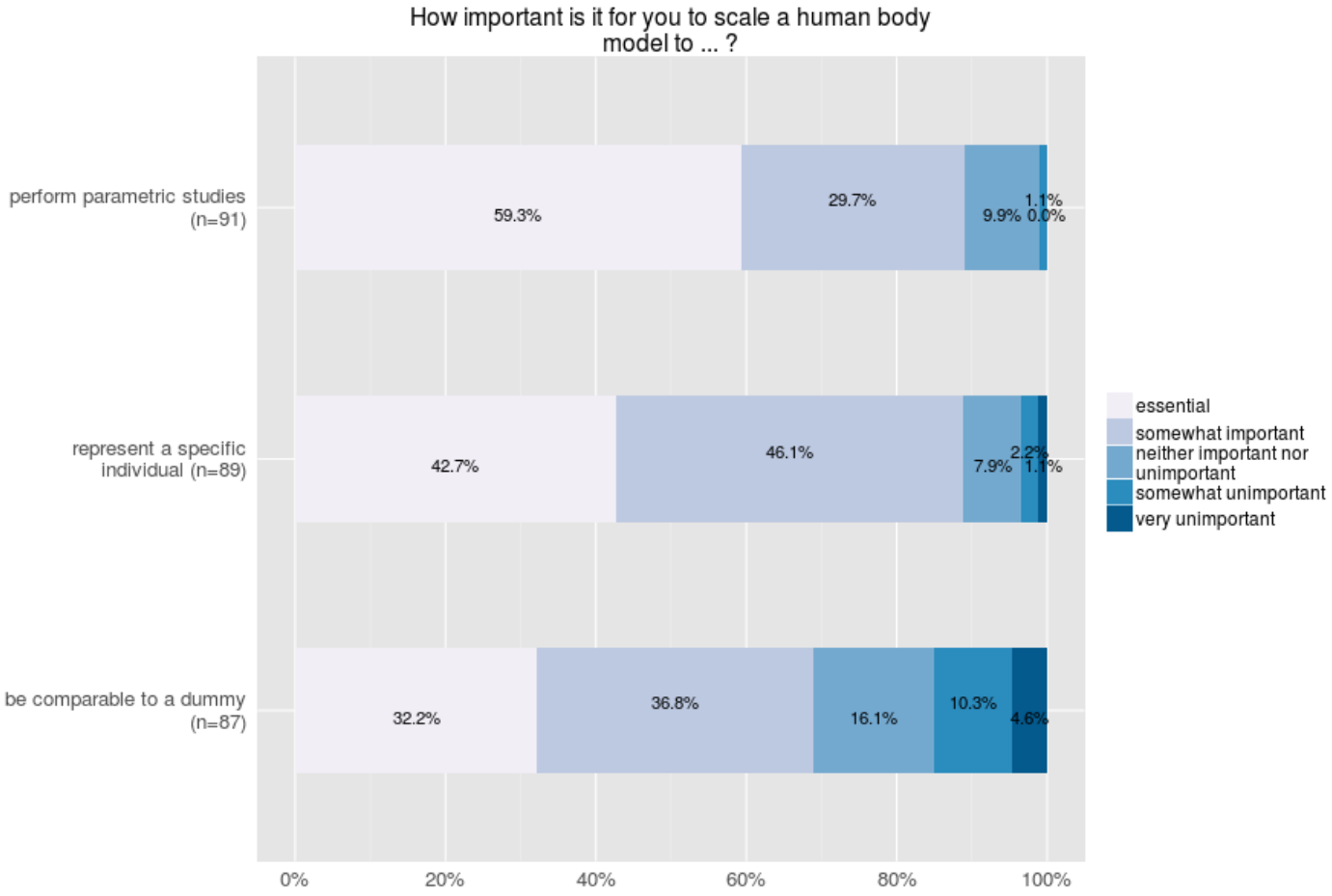
Other applications a positioning tool is used for:

```
hypermesh, CASIMIR, Transfer position of Pre-Crash Phase to crash model,
dismounted applications, Cyclist, Employ in toolchain, Comfort, orthopedics,
child hbm, dummy model positioning, Ergonomics and apparel design,
surgery planning, OOP simulations
```

3.4 How important is it for you to scale (personalize) a human body model to … ?

	essential	somewhat important	neither important nor unimportant	somewhat unimportant	very unimportant	No answer
represent a specific individual						
be comparable to a dummy						
perform parametric studies (analyse the influence of different body sizes/shapes)						

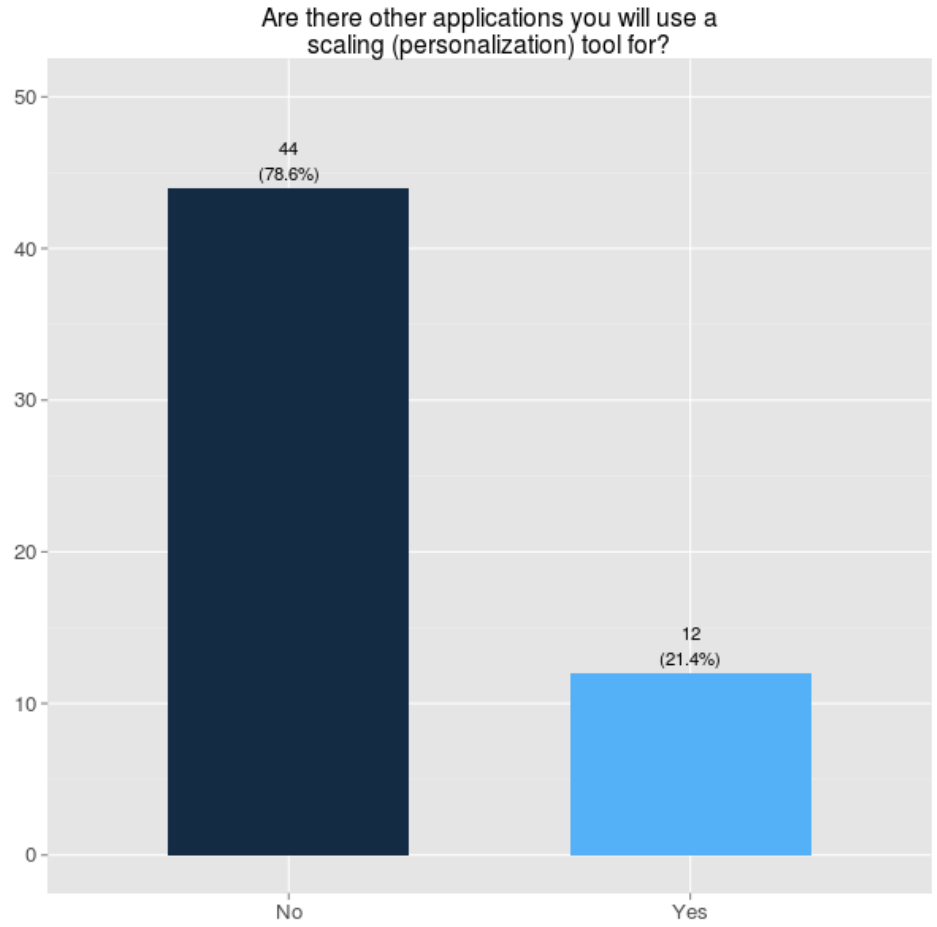
3.4.1 Results



3.5 Are there other applications you will use a scaling (personalization) tool for?

Choose one of the following answers
[ ] No
[ ] Yes: […..]
[ ] No answer

3.5.1 Results



Other applications a scaling (personalization) tool will be used for:

```
accident reconstruction, dismounted applications, to represent elder person,
occupant accommodation ,
Applications to other fields of injury biomechanics research: sports injuries, fall injuries etc,
orthopedics, Representing a distribution of the population,
recontruction real world cases, surgery, MADYMO
```

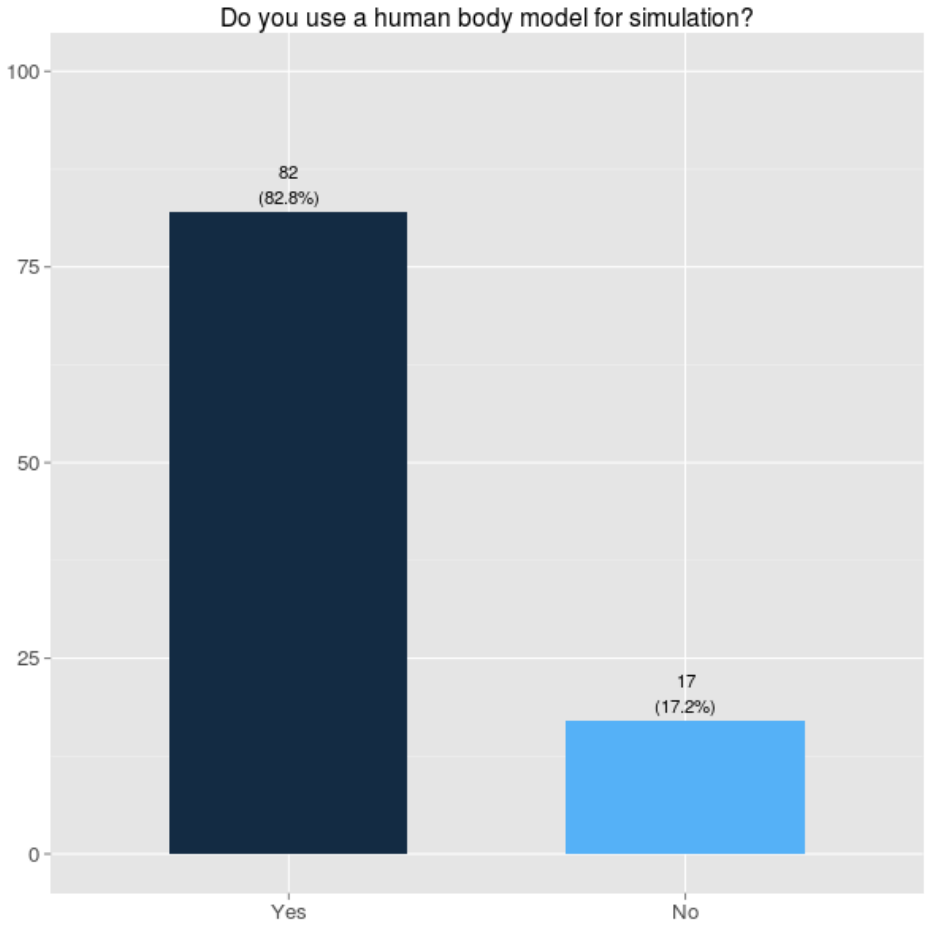
4 Your current simulation or positioning practice

Note: The word "position" basically means location and posture of the model.

4.1 Do you use a human body model for simulation?

[ ] Yes
[ ] No

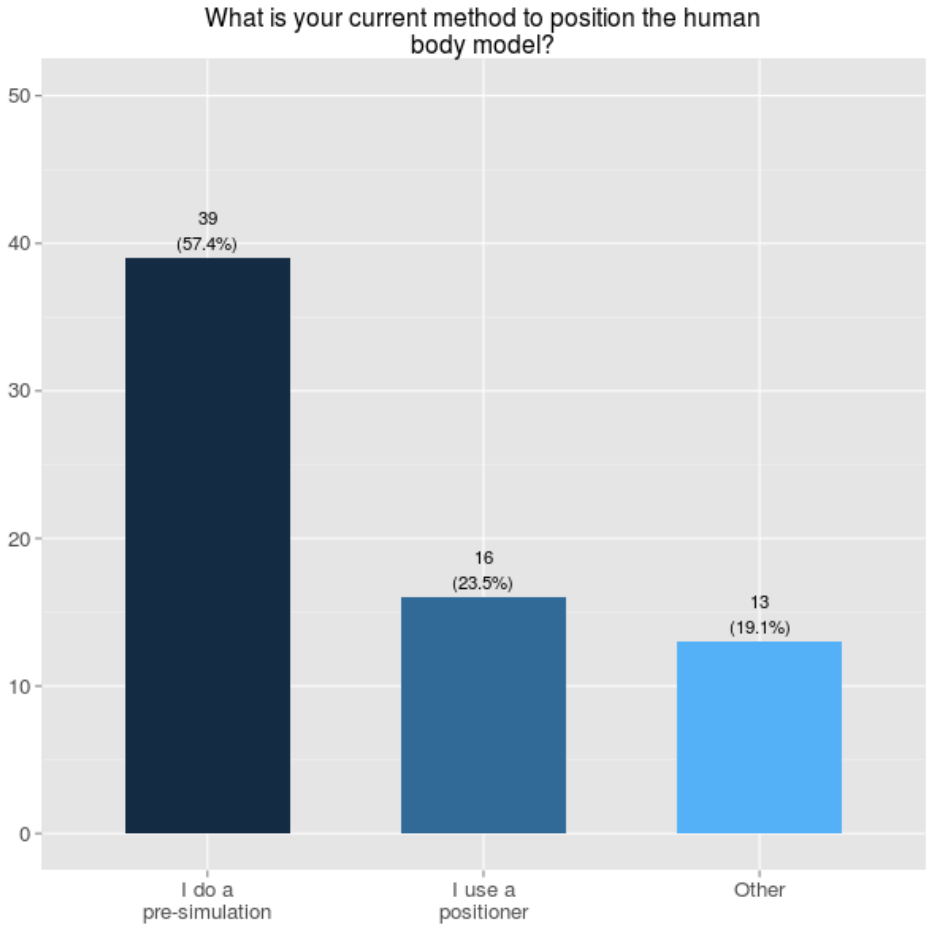
4.1.1 Result



4.2 What is your current method to position the human body model?

Choose one of the following answers.
[ ] I do a pre-simulation
[ ] I use a positioner
[ ] Other: […..]
[ ] No answer
If you use more than one method choose the method you use the most

4.2.1 Result



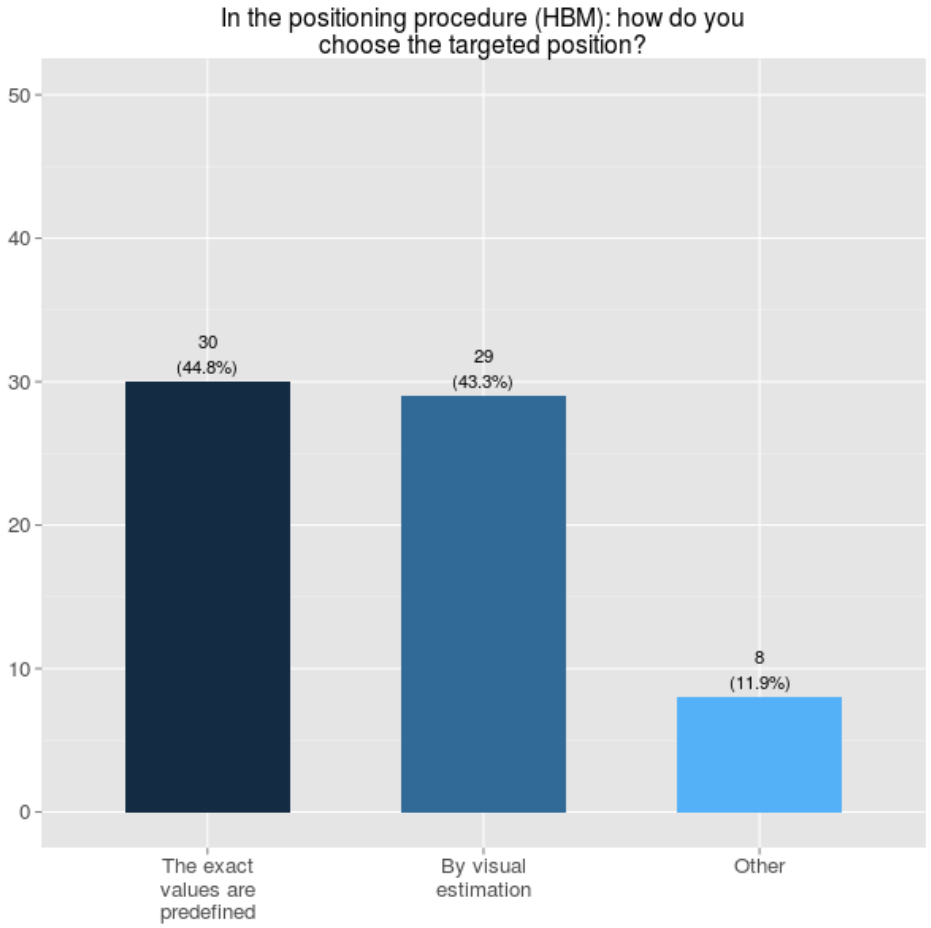
Other positioning methods:

```
pre-simulation or geometric modification, CASIMIR, I have no tool,
the model is in seating position, Manual (Ttranslation and rotation),
positioner followed by pre-simulation, ProdSig,
I get a positioned model from other source,
Both, presimulation and positining tool, positioner and pre-simulation,
positioner and pre-simulation, I receive a positioned model, Iteration
```

4.3 In the positioning procedure: how do you choose the targeted position?

Choose one of the following answers
[ ] By visual estimation
[ ] The exact values are predefined
[ ] Other methods: […..]
[ ] No answer
If you use more than one method choose the method you use the most

4.3.1 Result

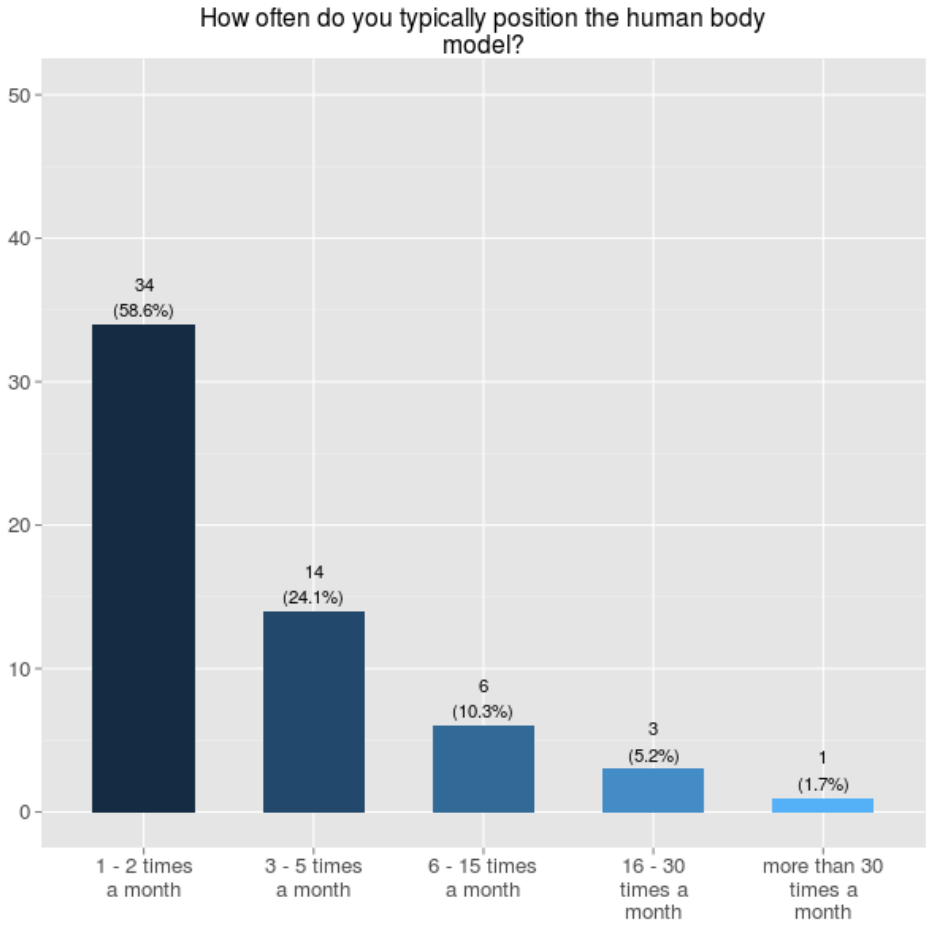


Other procedures to choose the targeted position:

```
as required (visual & exact values), both of the above mentioned,
Match the position of dummies approximately, matching anatomical landmarks,
Iteration , Based on volunteer test data, Best aproach to key parts
```

4.4 How often do you typically position the human body model?

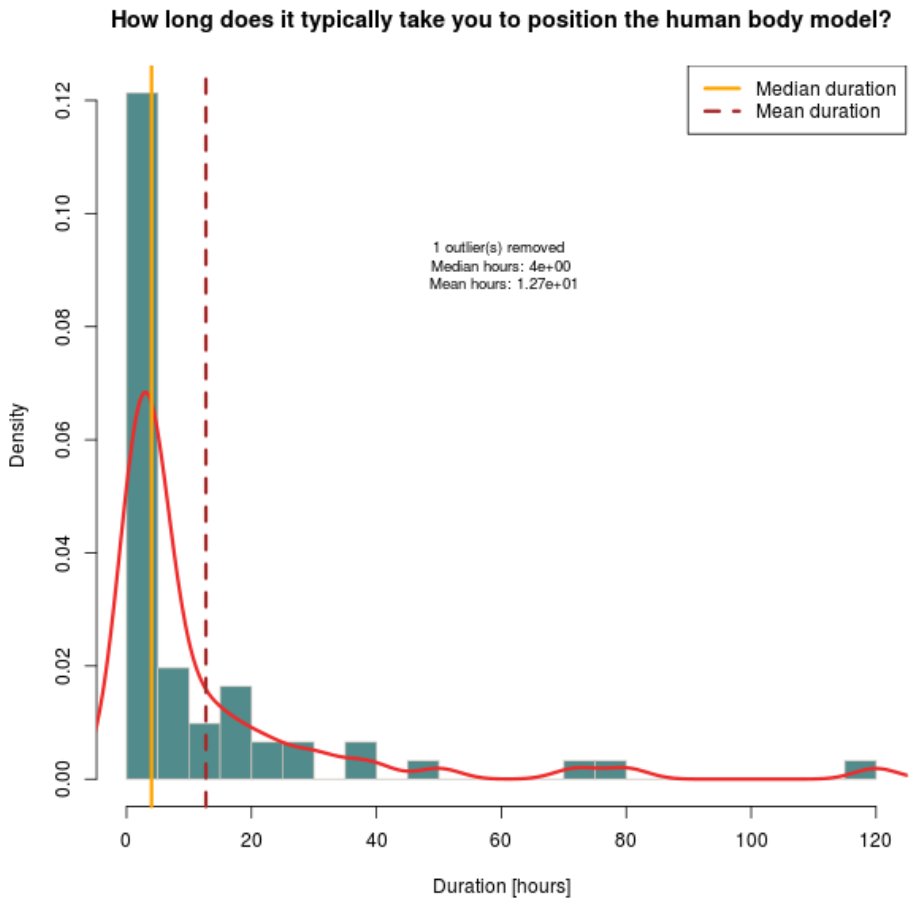
Choose one of the following answers
[ ] 1 - 2 times a month
[ ] 3 - 5 times a month
[ ] 6 - 15 times a month
[ ] 16 - 30 times a month
[ ] more than 30 times a month
[ ] No answer



4.5 How long does it typically take you to position the human body model?

Only integer value may be entered in this field.
[…..]. hours

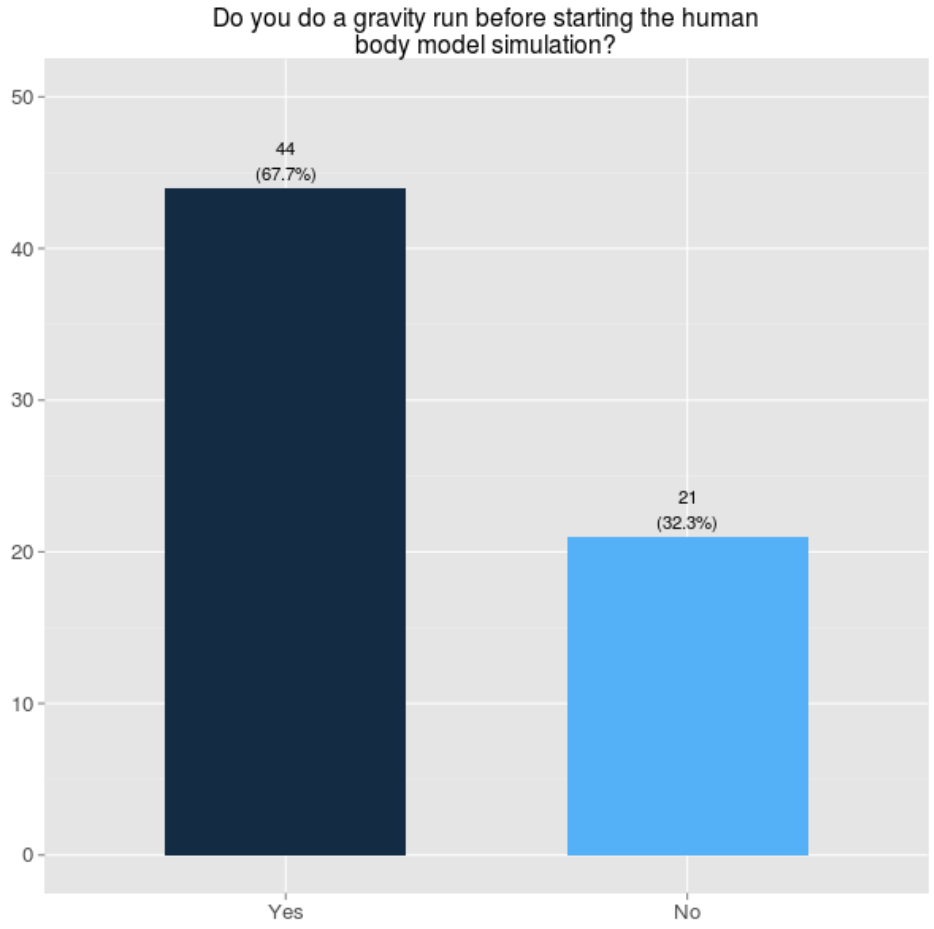
4.5.1 Results



4.6 Do you do a gravity run before starting the human body model simulation?

[ ] Yes
[ ] No
[ ] No answer

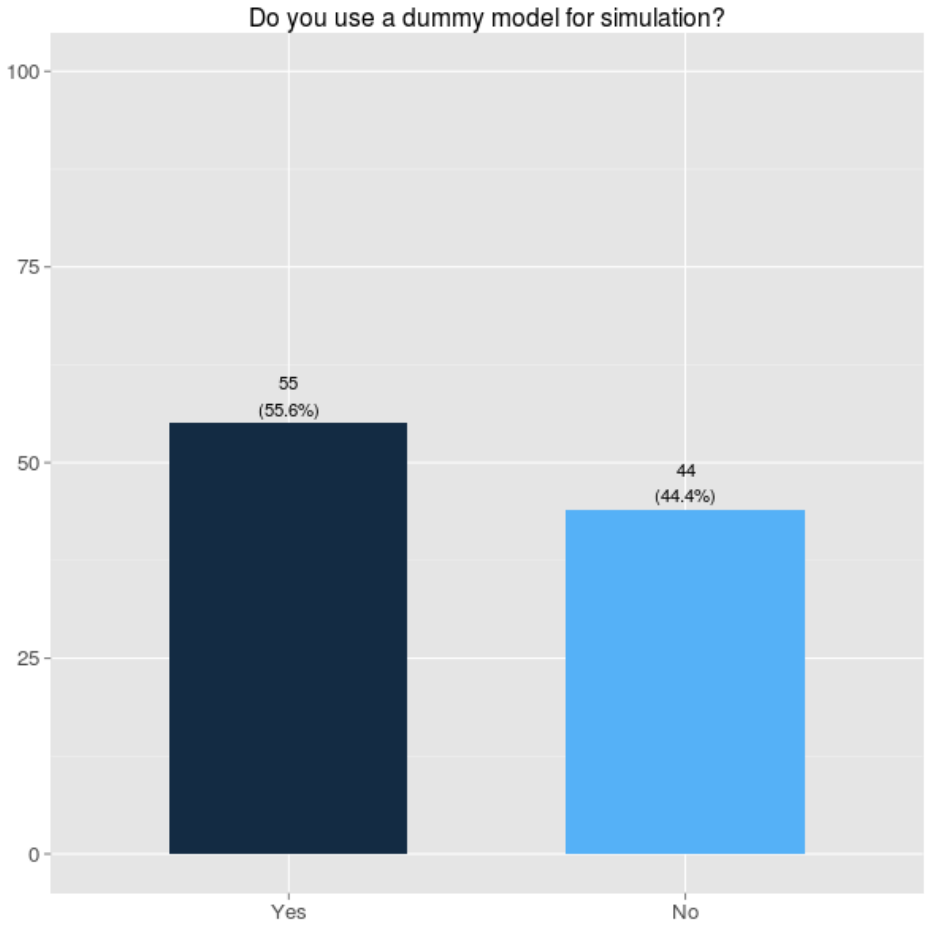
4.6.1 Result



4.7 Do you use a dummy model for simulation?

[ ] Yes
[ ] No

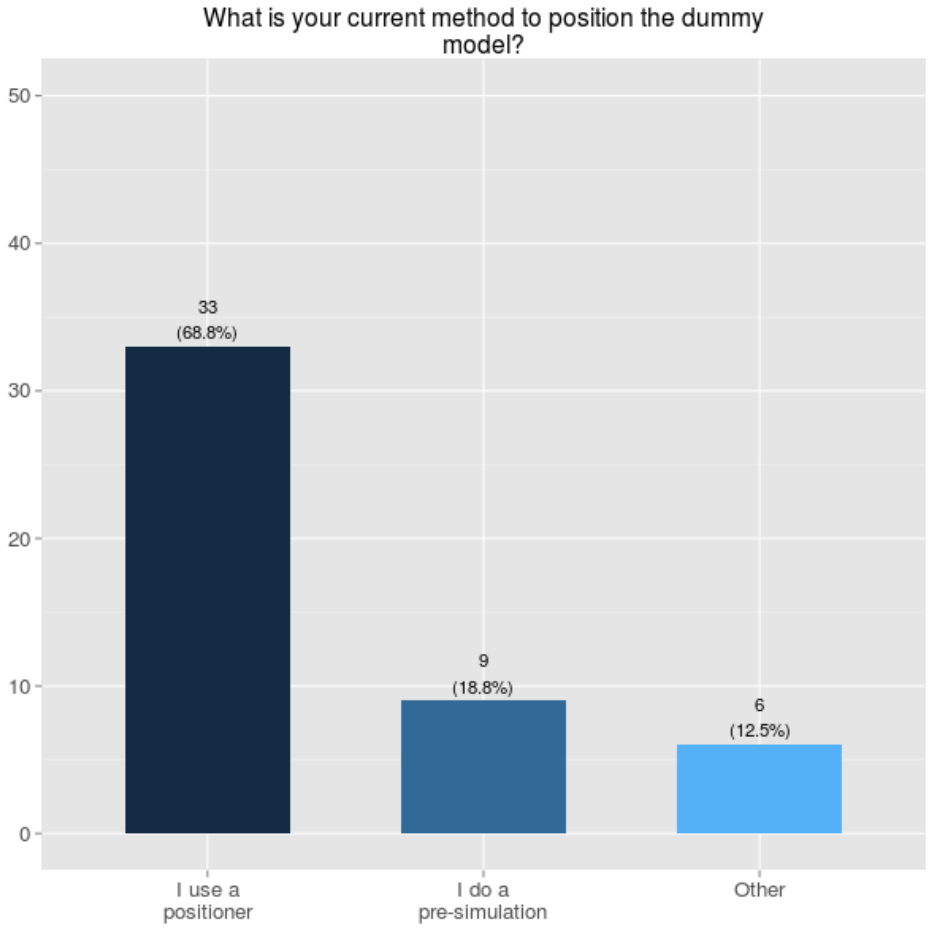
4.7.1 Result



4.8 What is your current method to position the dummy model?

Choose one of the following answers.
[ ] I do a pre-simulation
[ ] I use a positioner
[ ] Other: […..]
[ ] No answer
If you use more than one method choose the method you use the most

4.8.1 Result



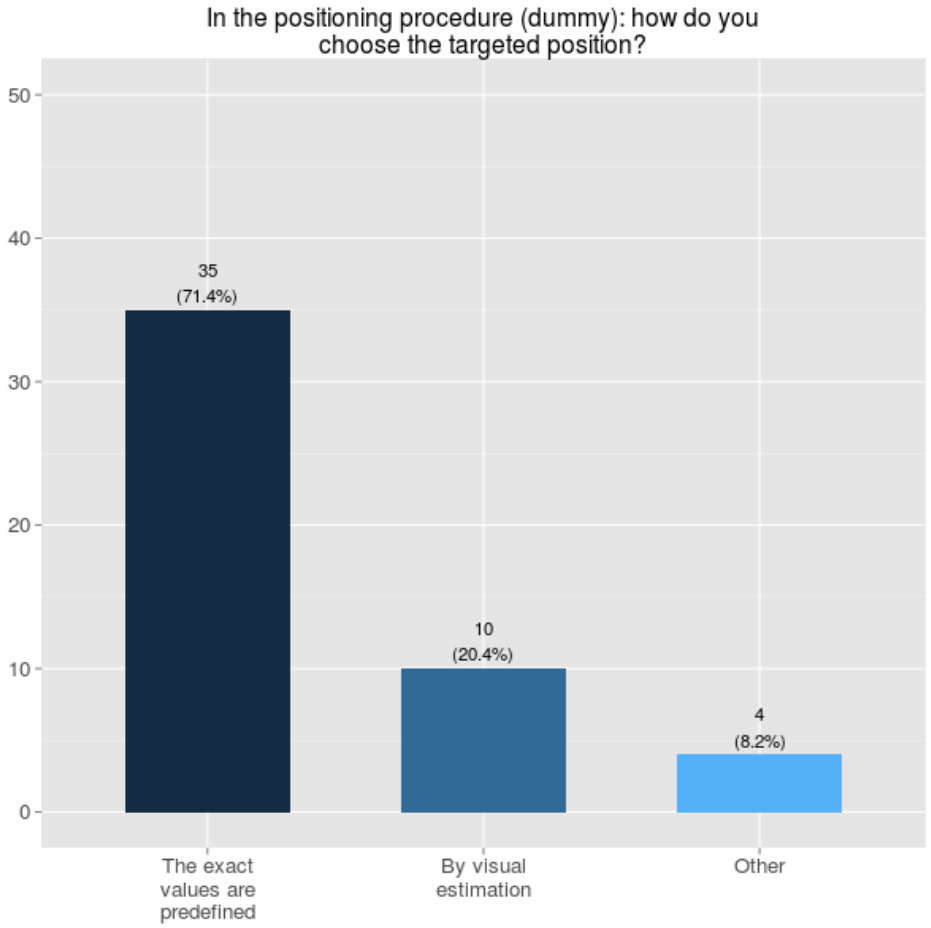
Other method to position the dummy model:

```
positioner followed by pre-simulation, ProdSig,
first positioner, than pre-simulation, both, Iteration , Repeated question!?
```

4.9 In the positioning procedure: how do you choose the targeted position?

Choose one of the following answers
[ ] By visual estimation
[ ] The exact values are predefined
[ ] Other methods: […..]
[ ] No answer
If you use more than one method choose the method you use the most

4.9.1 Result

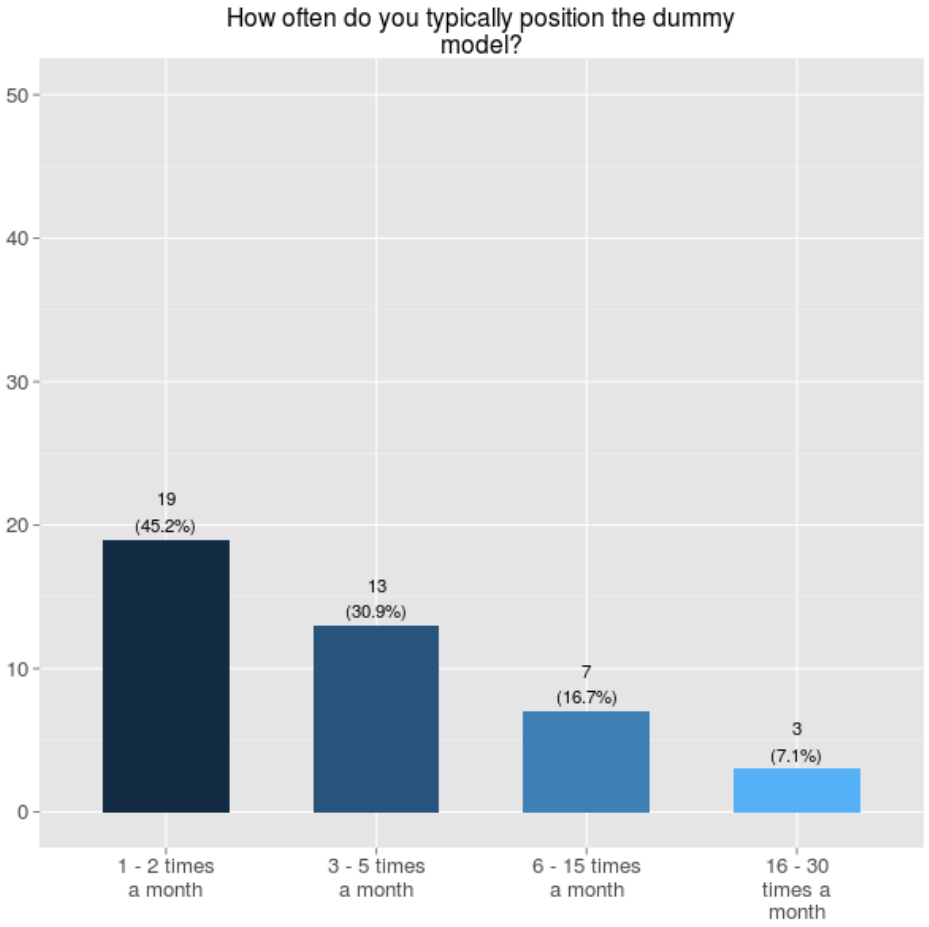


Other procedure to choose targeted position of a dummy:

```
real kid tryouts, matching FARO marker points, Iteration , Repeated question!?
```

4.10 How often do you typically position the dummy model?

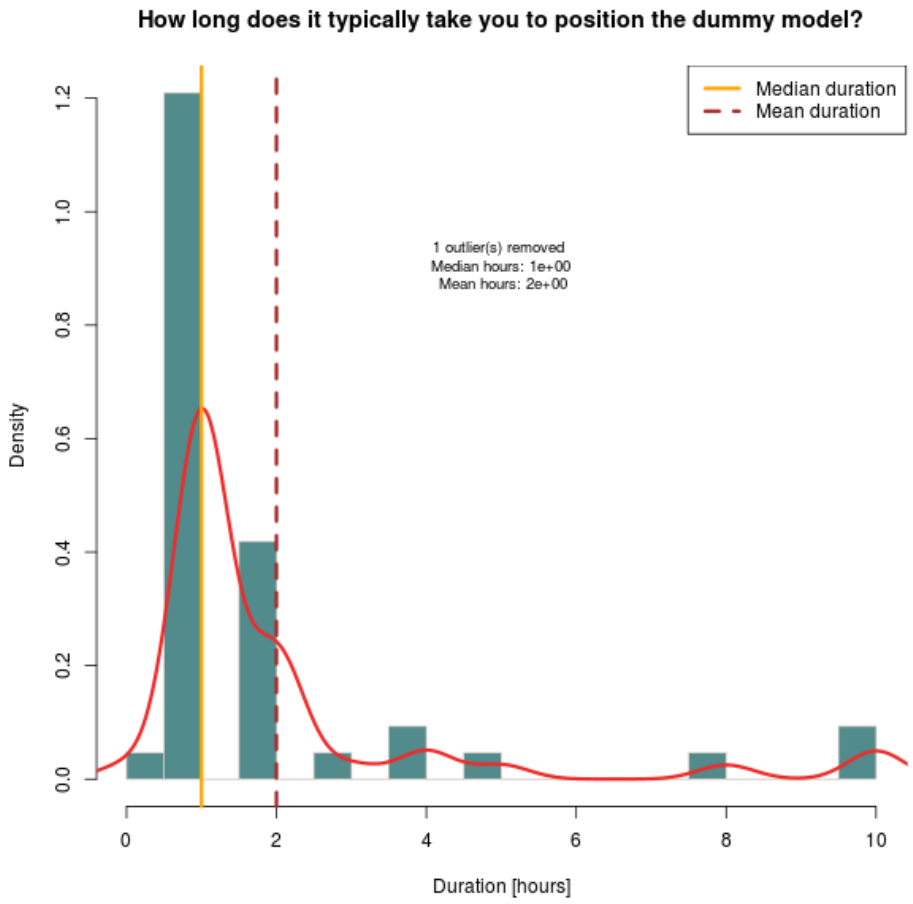
Choose one of the following answers
[ ] 1 - 2 times a month
[ ] 3 - 5 times a month
[ ] 6 - 15 times a month
[ ] 16 - 30 times a month
[ ] more than 30 times a month
[ ] No answer



4.11 How long does it typically take you to position the dummy model?

Only integer value may be entered in this field.
[…..] hours

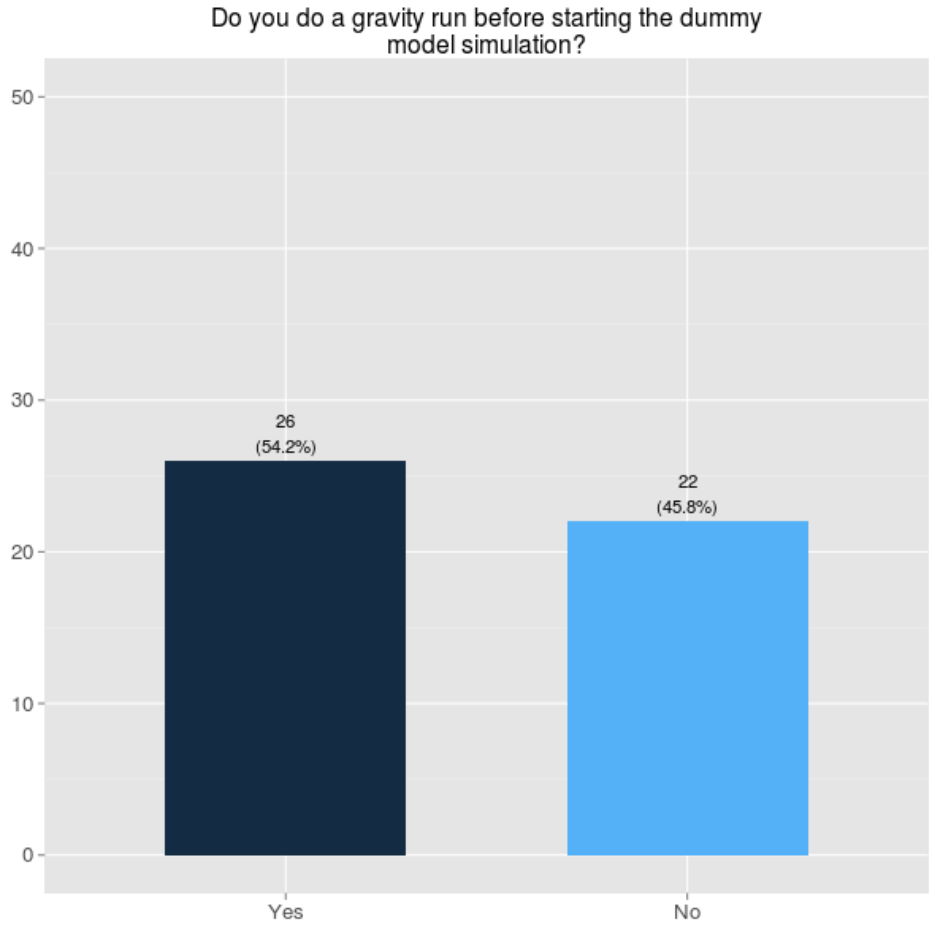
4.11.1 Results



4.12 Do you do a gravity run before starting the dummy model simulation?

[ ] Yes
[ ] No
[ ] No answer

4.12.1 Result



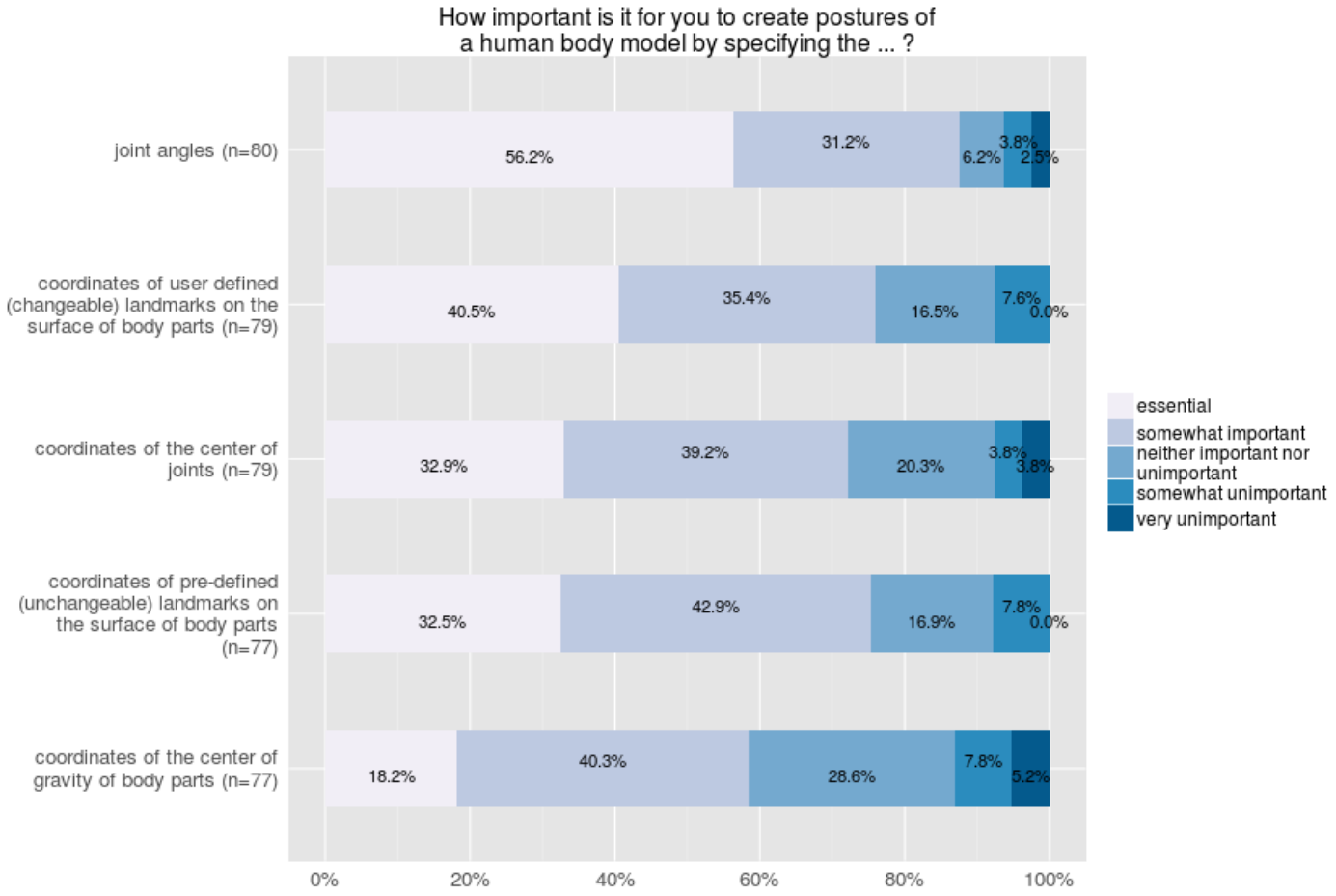
5 Methods to change the posture of a human body model

Note: If you currently don't use a human body model please answer the questions as if you would use one.

5.1 How important is it for you to create postures of a human body model by specifying the … ?

	essential	somewhat important	neither important nor unimportant	somewhat unimportant	very unimportant	No answer
joint angles						
coordinates of the center of joints						
coordinates of the center of gravity of body parts						
coordinates of pre-defined (unchangeable) landmarks on the surface of body parts						
coordinates of user defined (changeable) landmarks on the surface of body parts						

5.1.1 Results

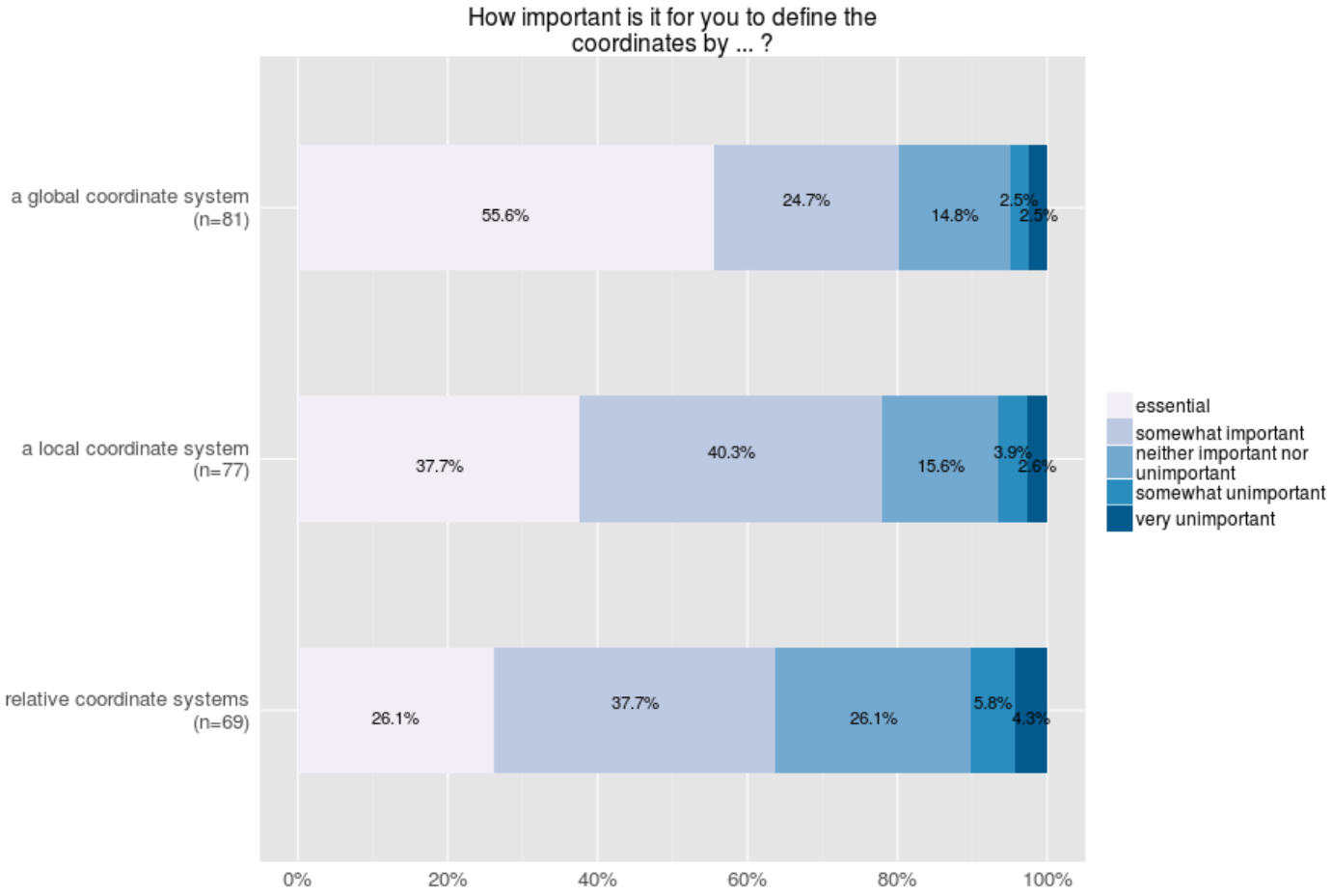


5.2 How important is it for you to define the coordinates by … ?

	essential	somewhat important	neither important nor unimportant	somewhat unimportant	very unimportant	no answer
a global coordinate system						
a local coordinate system						
relative coordinate systems						

Global coordinate system: You specify the coordinates of a body part or joint with respect to a coordinate system that is not connected to the model (e.g. the lab coordinate system)
Local coordinate system: You specify the coordinates of a body part or joint with respect to a coordinate system that is connected to the model (e.g. the origin of the coordinate system is the center of gravity of the whole model)
Relative coordinate systems: You specify the coordinates of a body part or joint with respect to a coordinate system that is connected to the parent body part (e.g. the coordinate system for the position of the wrist is a coordinate system connected to the upper arm and origin in the elbow joint)

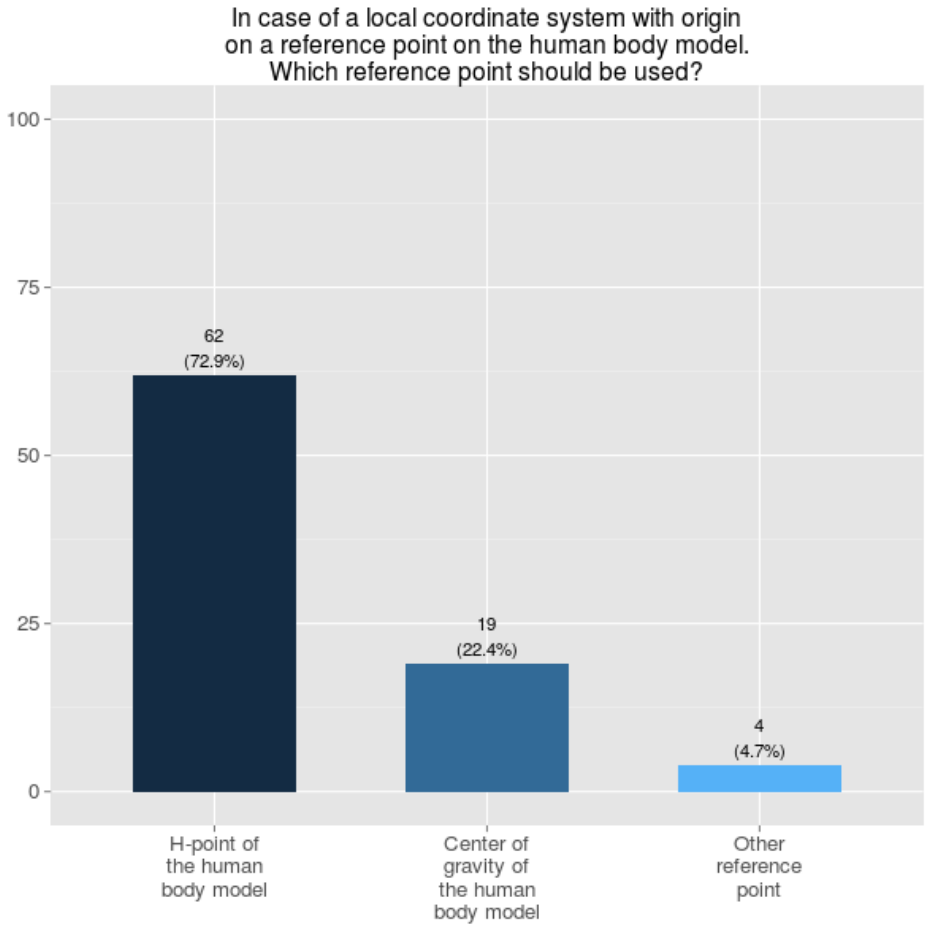
5.2.1 Results



5.3 In case of a local coordinate system with origin on a reference point on the human body model. Which reference point should be used?

Check any that apply
[ ] H-point of the human body model
[ ] Center of gravity of the human body model
[ ] Other reference point: […..]

5.3.1 Results



Other reference point that should be used:

```
Head cog, multiple / lokal rev. points , head cog, head reference plane
```

6 Human body model postures for occupant simulations

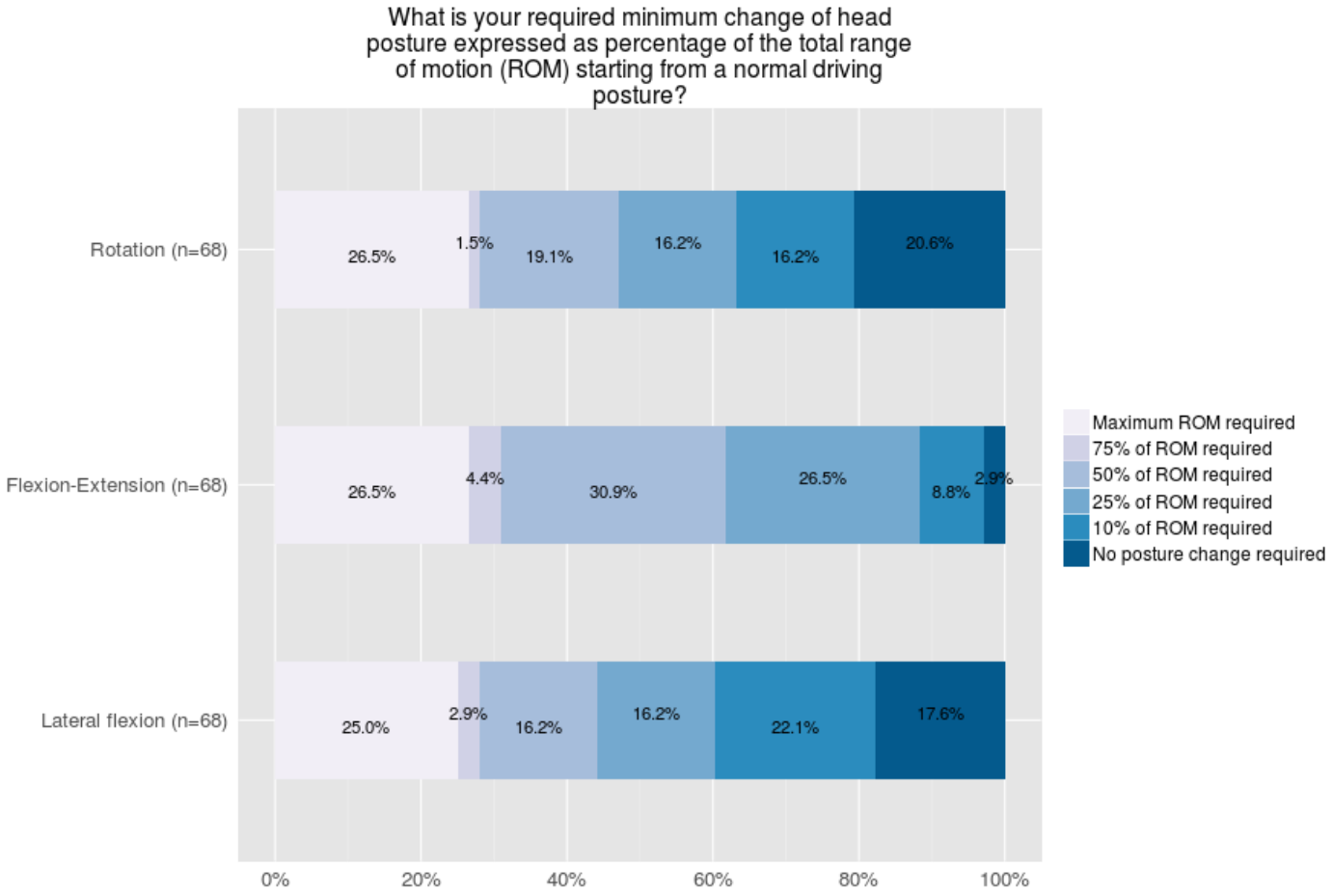
Note: If you currently don't use a occupant human body model please answer the questions as if you would use one.

6.1 What is your required minimum change of head posture expressed as percentage of the total range of motion (ROM) starting from a normal driving posture?

	No posture change required	10% of ROM required	25% of ROM required	50% of ROM required	75% of ROM required	Maximum ROM required	No answer
Flexion-Extension							
Lateral flexion							
Rotation							

Range of motion (ROM) is the movement of a joint from one extrem position to the opposite extrem position.

6.1.1 Result

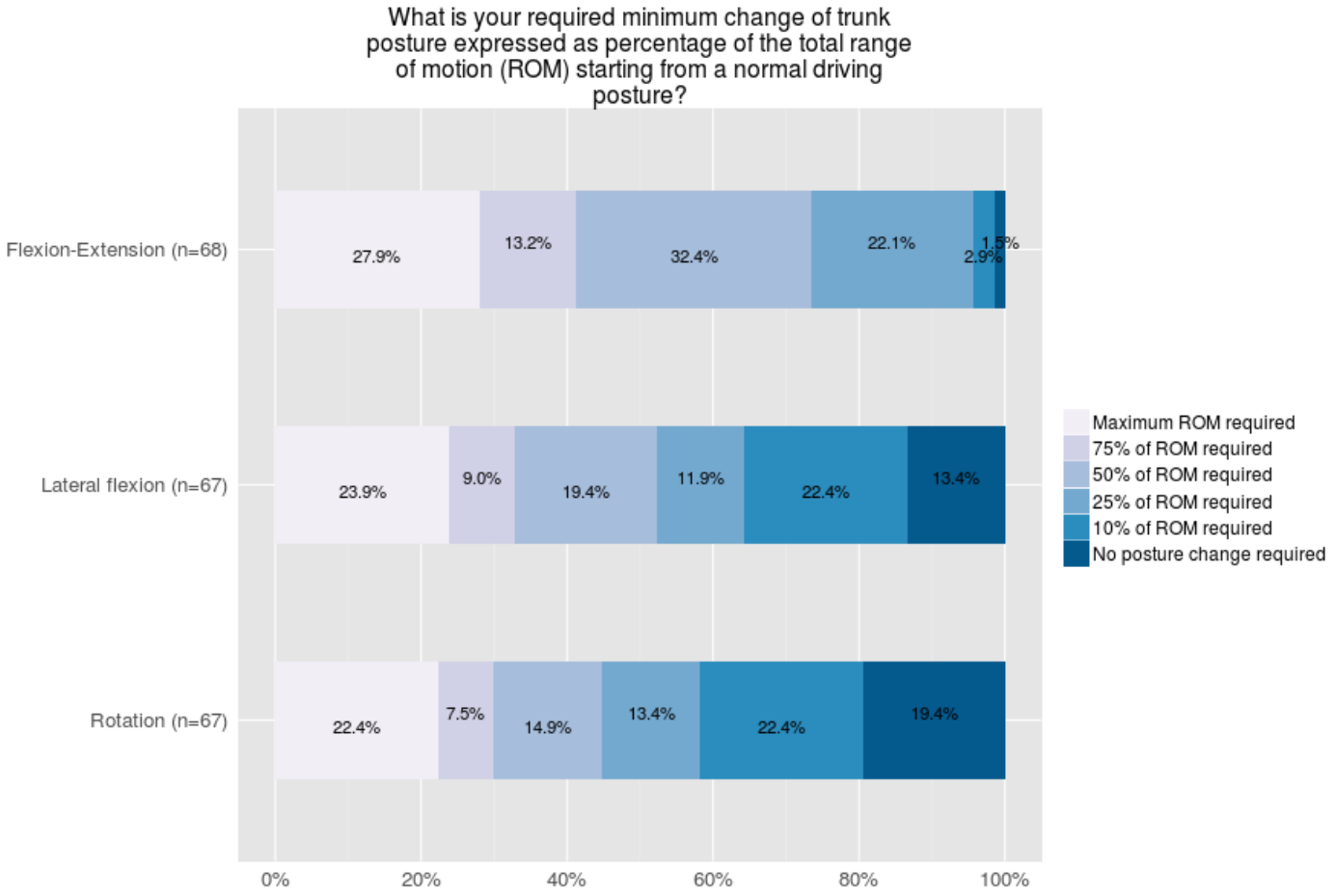


6.2 What is your required minimum change of trunk posture expressed as percentage of the total range of motion (ROM) starting from a normal driving posture?

	No posture change required	10% of ROM required	25% of ROM required	50% of ROM required	75% of ROM required	Maximum ROM required	No answer
Flexion-Extension							
Lateral flexion							
Rotation							

Range of motion (ROM) is the movement of a joint from one extrem position to the opposite extrem position.

6.2.1 Result

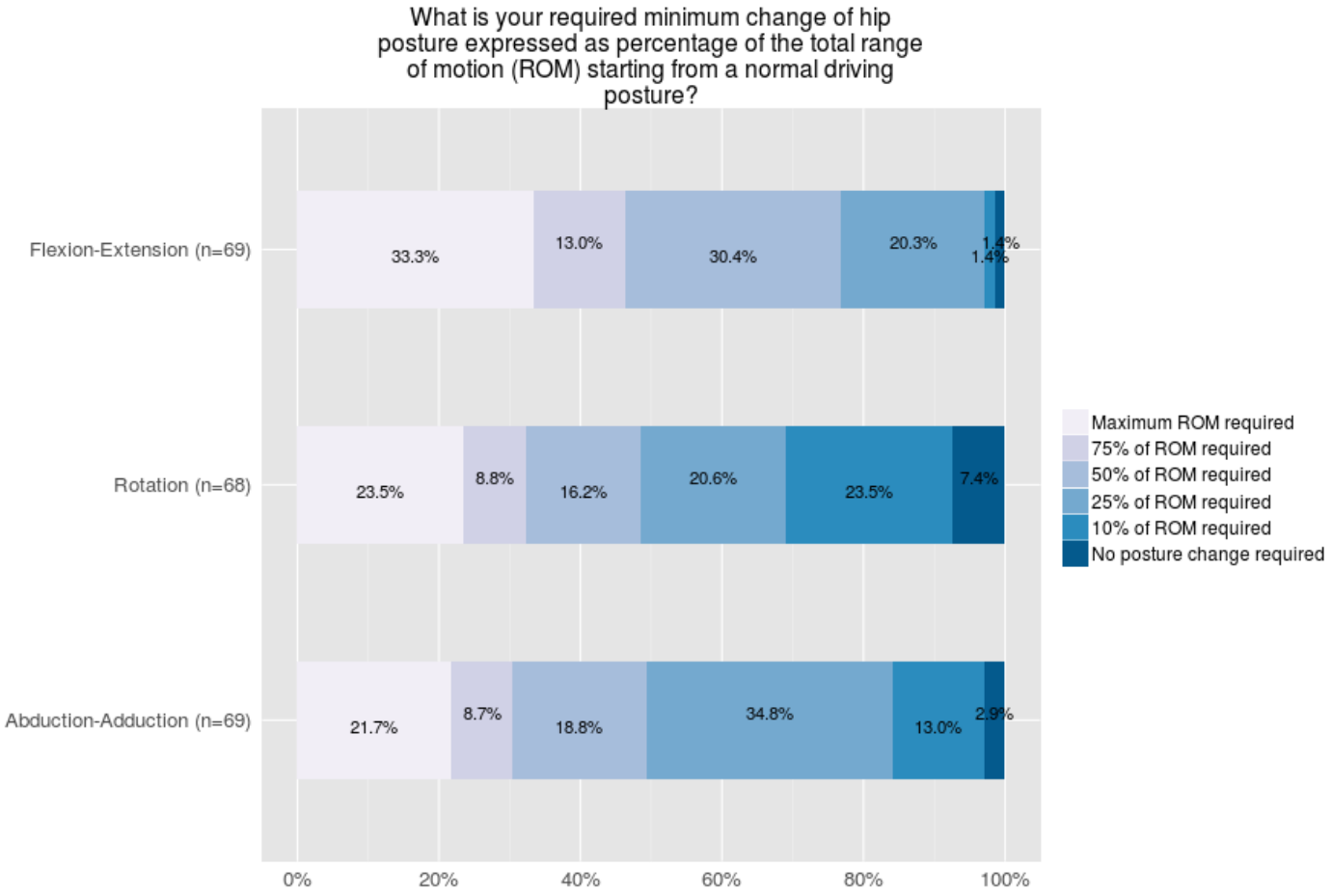


6.3 What is your required minimum change of hip posture expressed as percentage of the total range of motion (ROM) starting from a normal driving posture?

	No posture change required	10% of ROM required	25% of ROM required	50% of ROM required	75% of ROM required	Maximum ROM required	No answer
Flexion-Extension							
Abduction-Adduction							
Rotation							

Range of motion (ROM) is the movement of a joint from one extrem position to the opposite extrem position.

6.3.1 Result

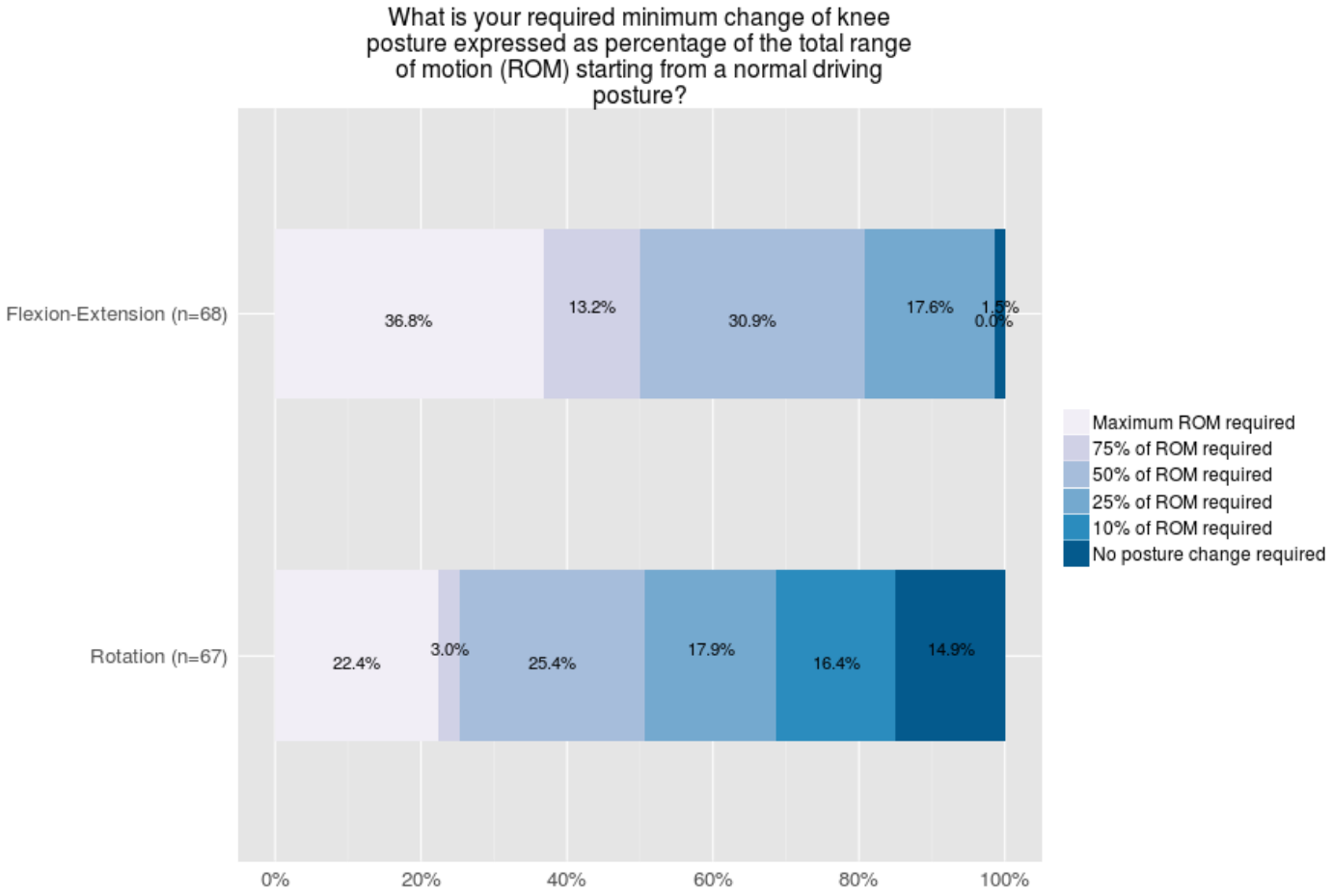


6.4 What is your required minimum change of knee posture expressed as percentage of the total range of motion (ROM) starting from a normal driving posture?

	No posture change required	10% of ROM required	25% of ROM required	50% of ROM required	75% of ROM required	Maximum ROM required	No answer
Flexion-Extension							
Rotation							

Range of motion (ROM) is the movement of a joint from one extrem position to the opposite extrem position.

6.4.1 Result

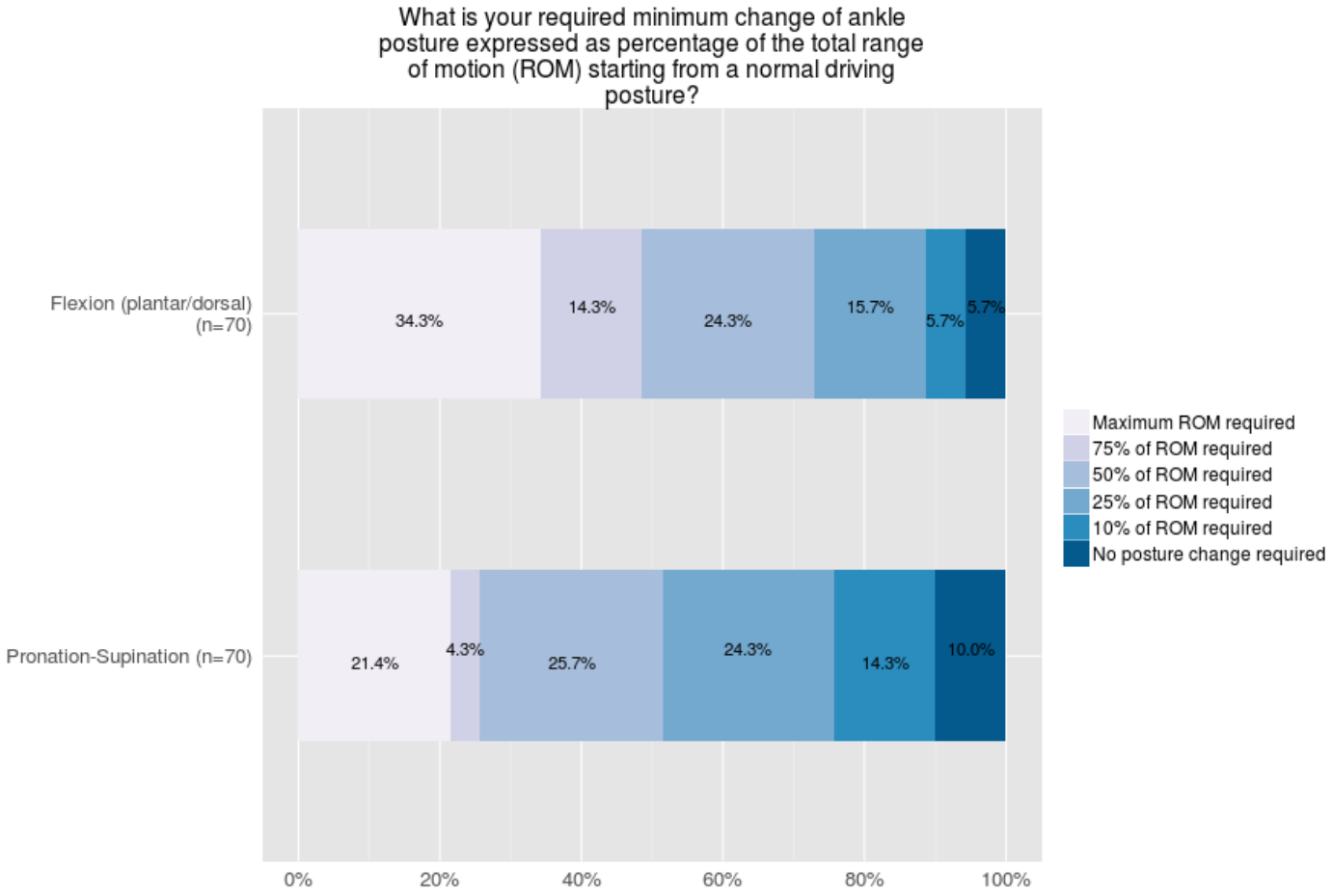


6.5 What is your required minimum change of ankle posture expressed as percentage of the total range of motion (ROM) starting from a normal driving posture?

	No posture change required	10% of ROM required	25% of ROM required	50% of ROM required	75% of ROM required	Maximum ROM required	No answer
Flexion (plantar/dorsal)							
Pronation-Supination							

Range of motion (ROM) is the movement of a joint from one extrem position to the opposite extrem position.

6.5.1 Result

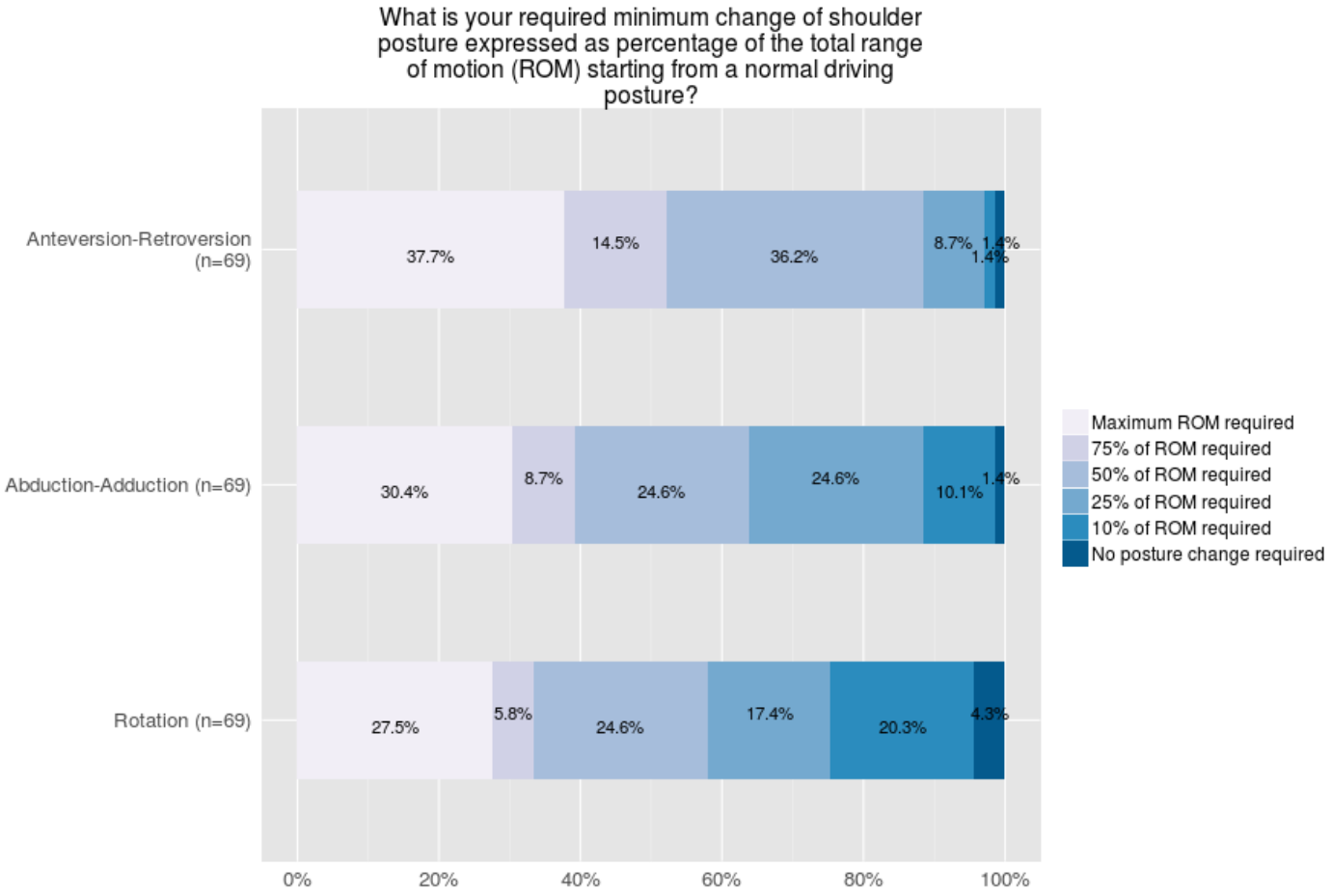


6.6 What is your required minimum change of shoulder posture expressed as percentage of the total range of motion (ROM) starting from a normal driving posture?

	No posture change required	10% of ROM required	25% of ROM required	50% of ROM required	75% of ROM required	Maximum ROM required	No answer
Flexion-Extension							
Abduction-Adduction							
Rotation							

Range of motion (ROM) is the movement of a joint from one extrem position to the opposite extrem position.

6.6.1 Result

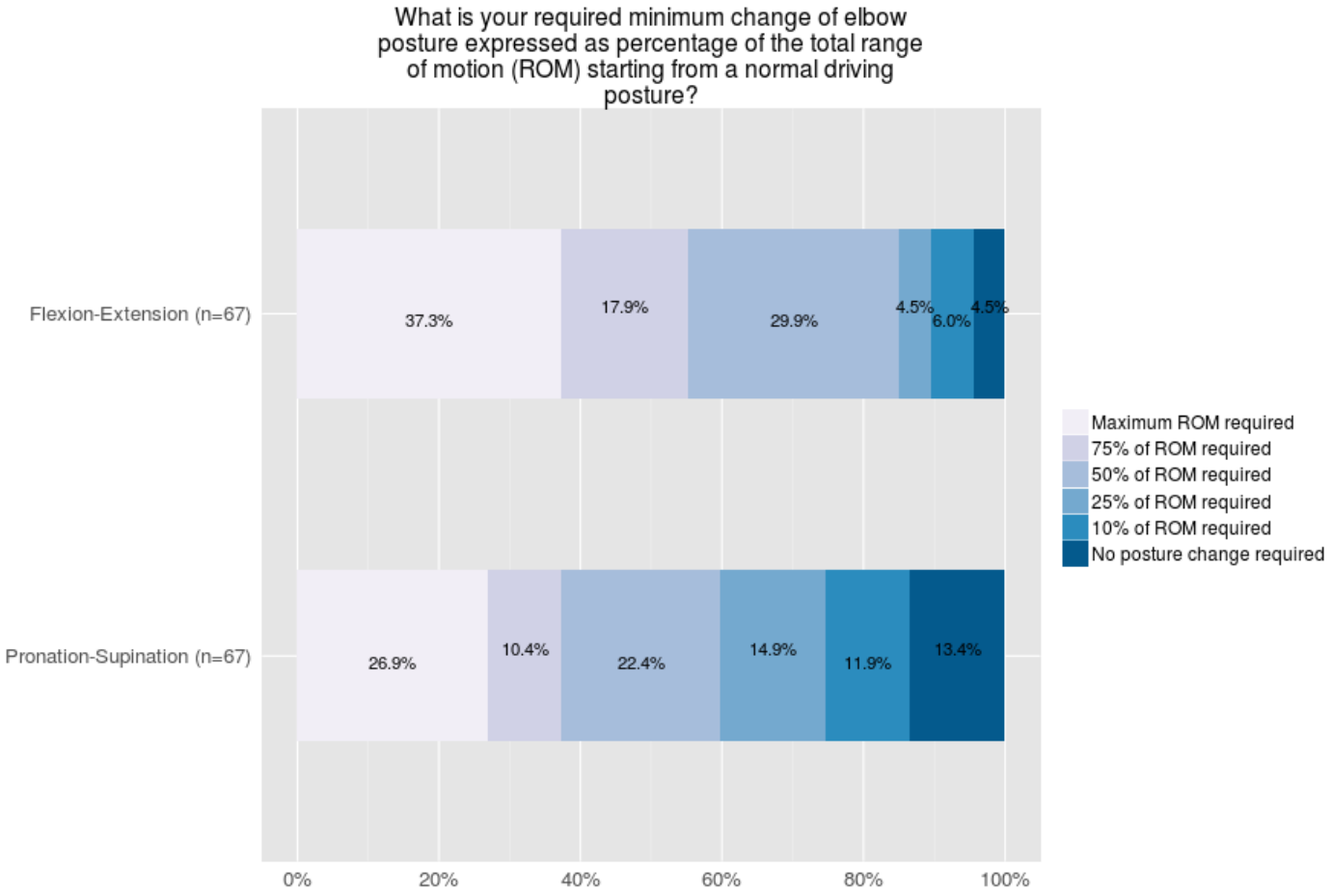


6.7 What is your required minimum change of elbow posture expressed as percentage of the total range of motion (ROM) starting from a normal driving posture?

	No posture change required	10% of ROM required	25% of ROM required	50% of ROM required	75% of ROM required	Maximum ROM required	No answer
Flexion-Extension							
Pronation-Supination							

Range of motion (ROM) is the movement of a joint from one extrem position to the opposite extrem position.

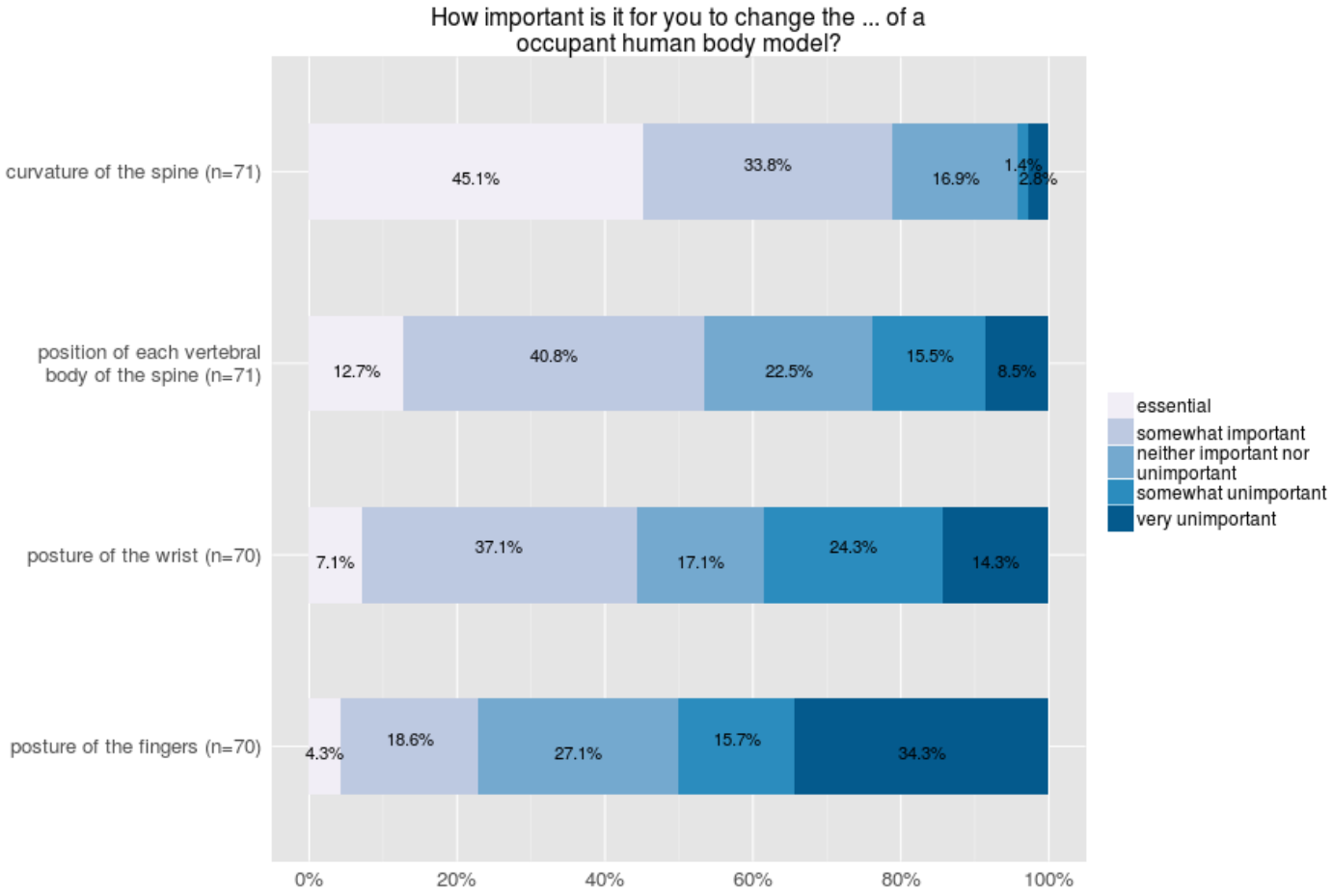
6.7.1 Result



6.8 How important is it for you to change the … of a occupant human body model?

	essential	somewhat important	neither important nor unimportant	somewhat unimportant	very unimportant	No answer
curvature of the spine						
position of each vertebral body of the spine						
posture of the wrist						
posture of the fingers						

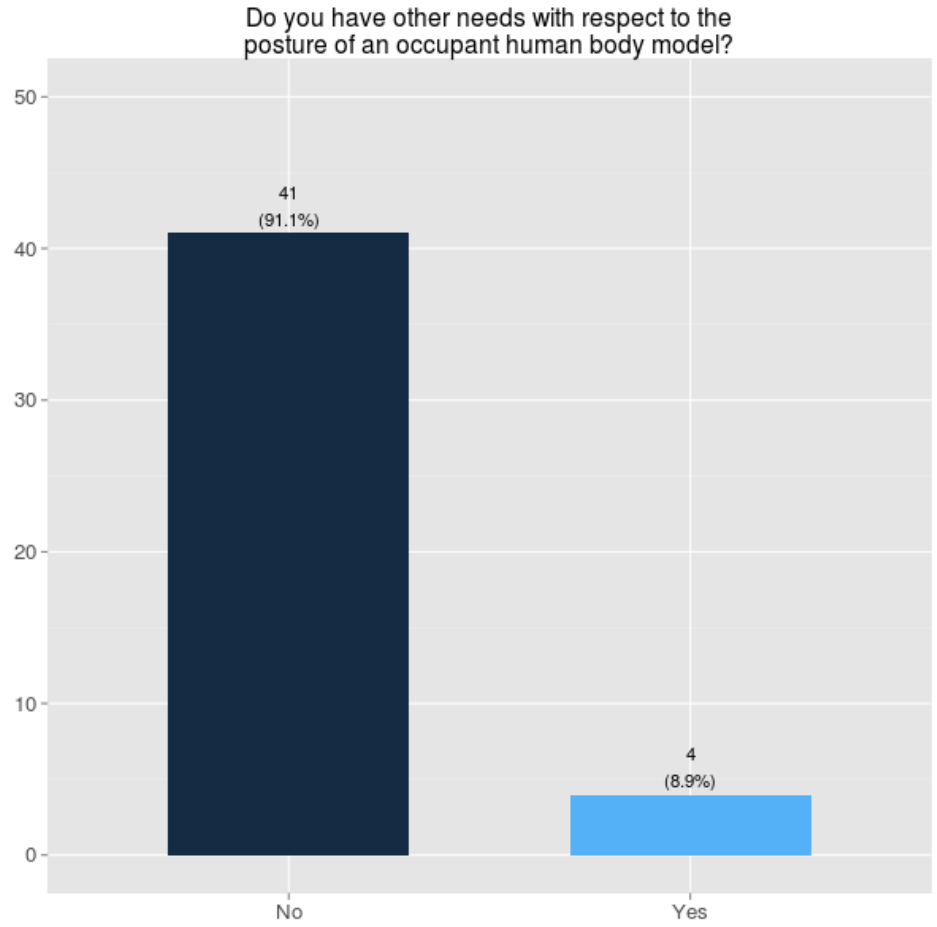
6.8.1 Results



6.9 Do you have other needs with respect to the posture of an occupant human body model?

Choose one of the following answers
[ ] No
[ ] Yes: […..]
[ ] No answer

6.9.1 Result



Other needs with respect to the posture of an occupant human body model:

```
shoulder shrugging, maximum ROM (PMHS with hanging shoulders),
set the pelvis angle, good mesh quality for crash simulation after positioning,
Rib position
```

7 Human body model postures for pedestrian simulations

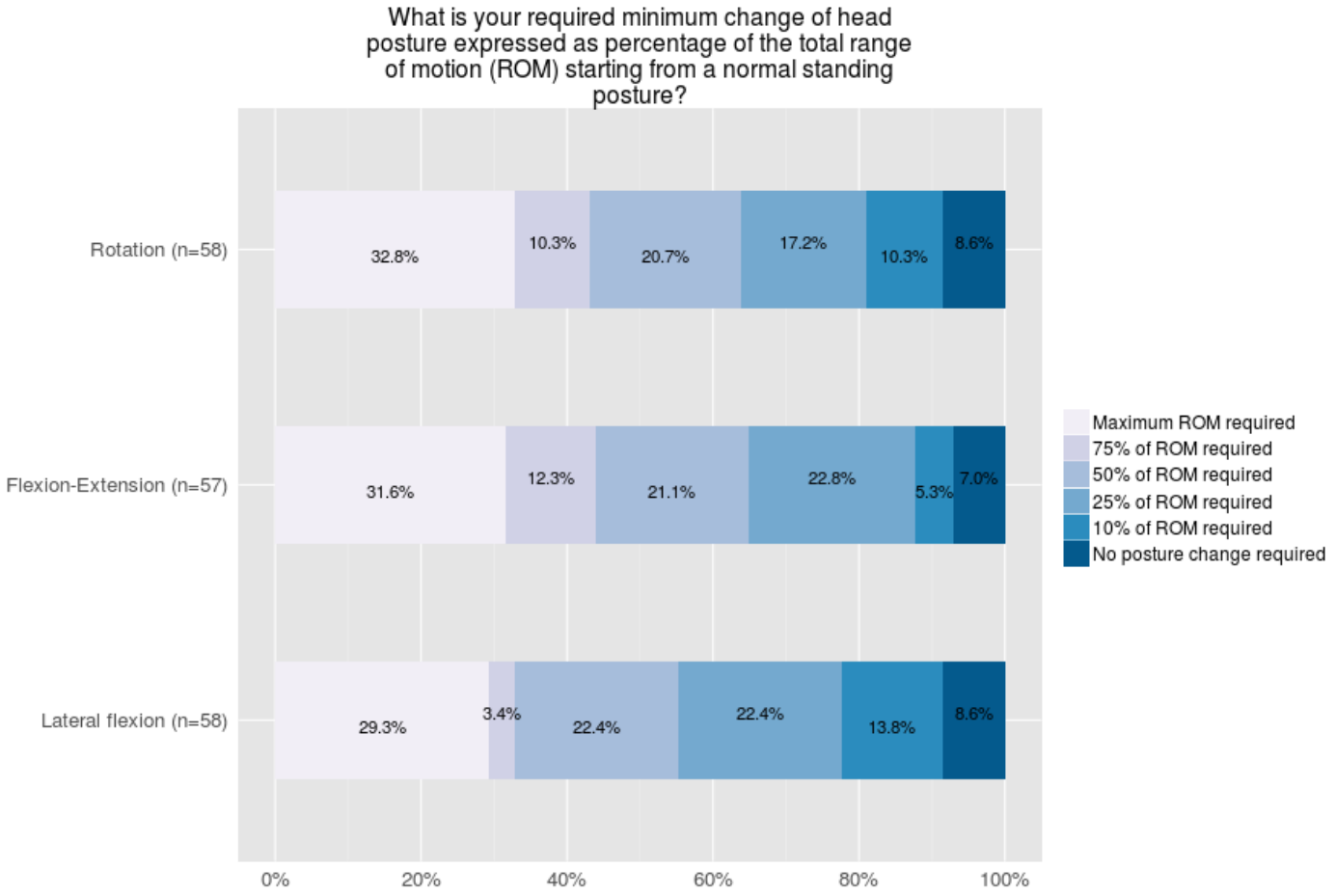
Note: If you currently don't use a pedestrian human body model please answer the questions as if you would use one.

7.1 What is your required minimum change of head posture expressed as percentage of the total range of motion (ROM) starting from a normal standing posture?

	No posture change required	10% of ROM required	25% of ROM required	50% of ROM required	75% of ROM required	Maximum ROM required	No answer
Flexion-Extension							
Lateral flexion							
Rotation							

Range of motion (ROM) is the movement of a joint from one extrem position to the opposite extrem position.

7.1.1 Result

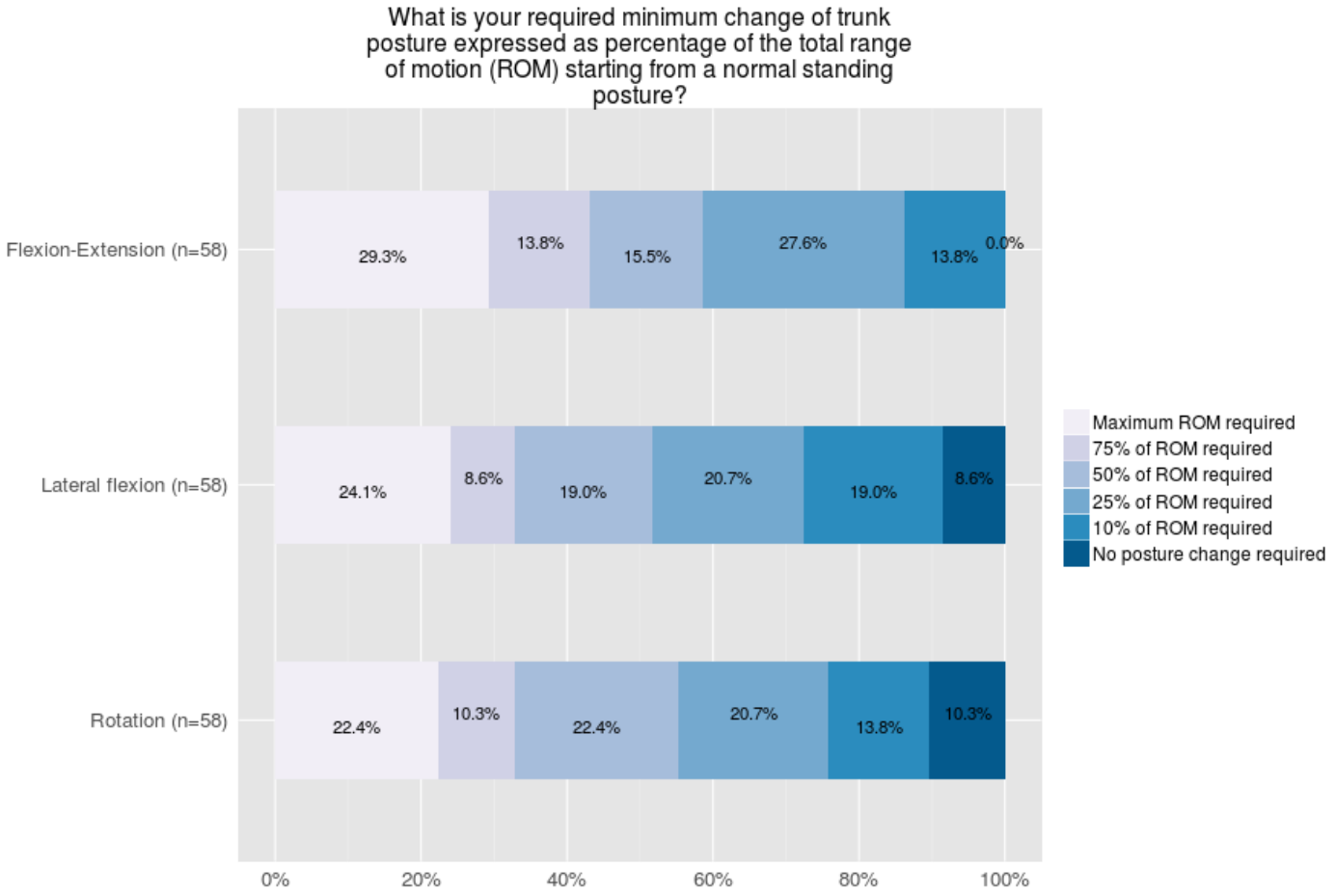


7.2 What is your required minimum change of trunk posture expressed as percentage of the total range of motion (ROM) starting from a normal standing posture?

	No posture change required	10% of ROM required	25% of ROM required	50% of ROM required	75% of ROM required	Maximum ROM required	No answer
Flexion-Extension							
Lateral flexion							
Rotation							

Range of motion (ROM) is the movement of a joint from one extrem position to the opposite extrem position.

7.2.1 Result

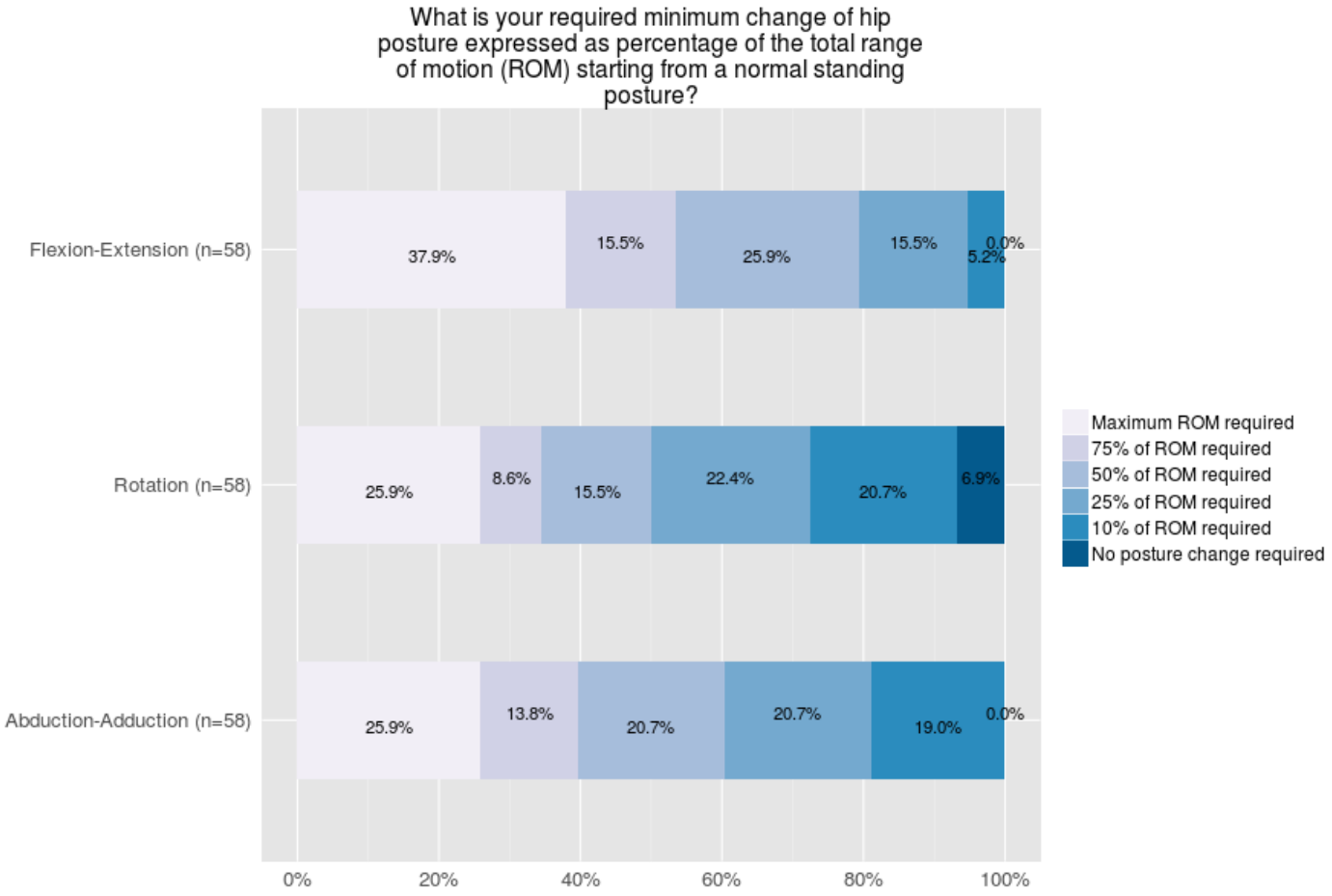


7.3 What is your required minimum change of hip posture expressed as percentage of the total range of motion (ROM) starting from a normal standing posture?

	No posture change required	10% of ROM required	25% of ROM required	50% of ROM required	75% of ROM required	Maximum ROM required	No answer
Flexion-Extension							
Abduction-Adduction							
Rotation							

Range of motion (ROM) is the movement of a joint from one extrem position to the opposite extrem position.

7.3.1 Result

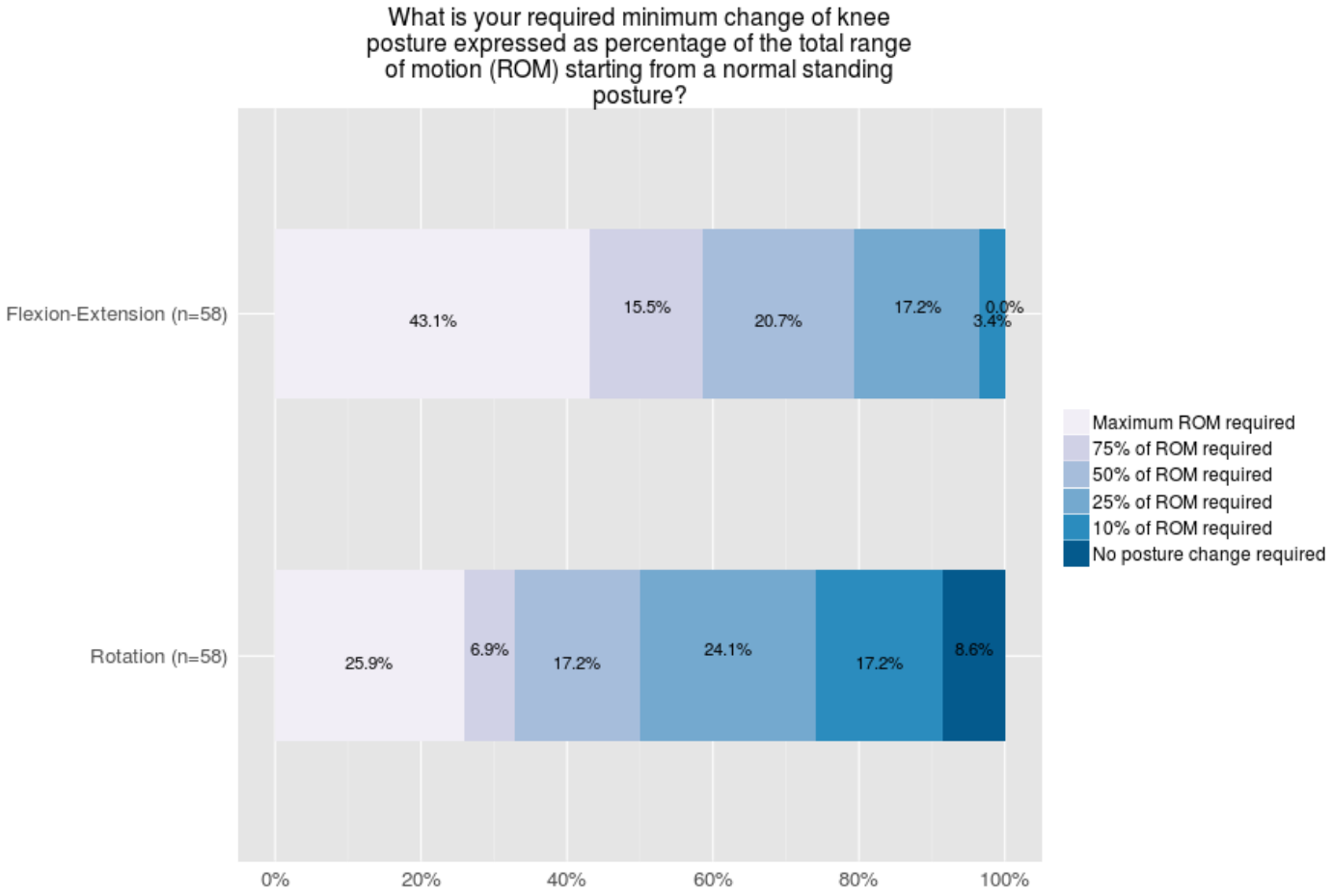


7.4 What is your required minimum change of knee posture expressed as percentage of the total range of motion (ROM) starting from a normal standing posture?

	No posture change required	10% of ROM required	25% of ROM required	50% of ROM required	75% of ROM required	Maximum ROM required	No answer
Flexion-Extension							
Rotation							

Range of motion (ROM) is the movement of a joint from one extrem position to the opposite extrem position.

7.4.1 Result

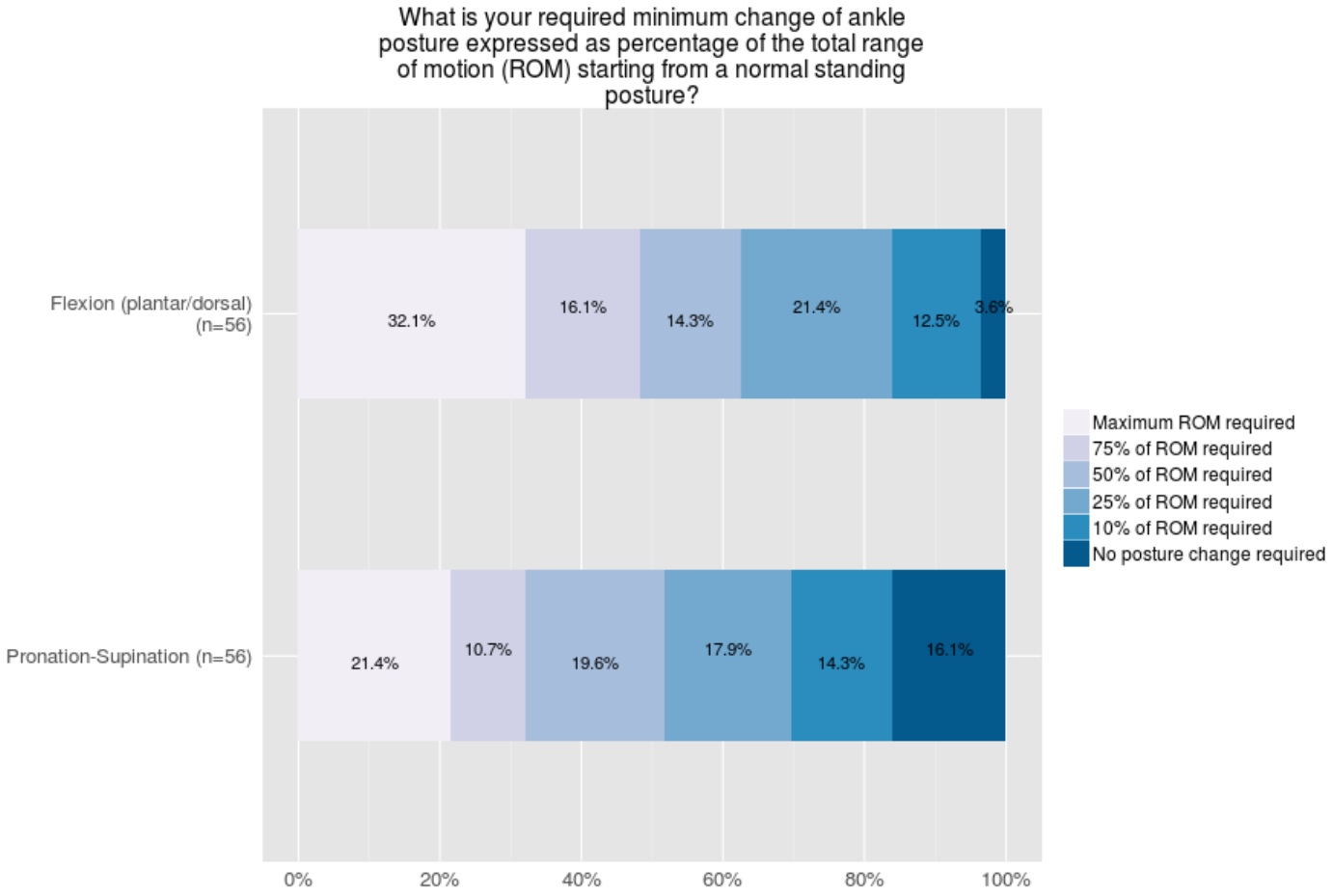


7.5 What is your required minimum change of ankle posture expressed as percentage of the total range of motion (ROM) starting from a normal standing posture?

	No posture change required	10% of ROM required	25% of ROM required	50% of ROM required	75% of ROM required	Maximum ROM required	No answer
Flexion (plantar/dorsal)							
Pronation-Supination							

Range of motion (ROM) is the movement of a joint from one extrem position to the opposite extrem position.

7.5.1 Result

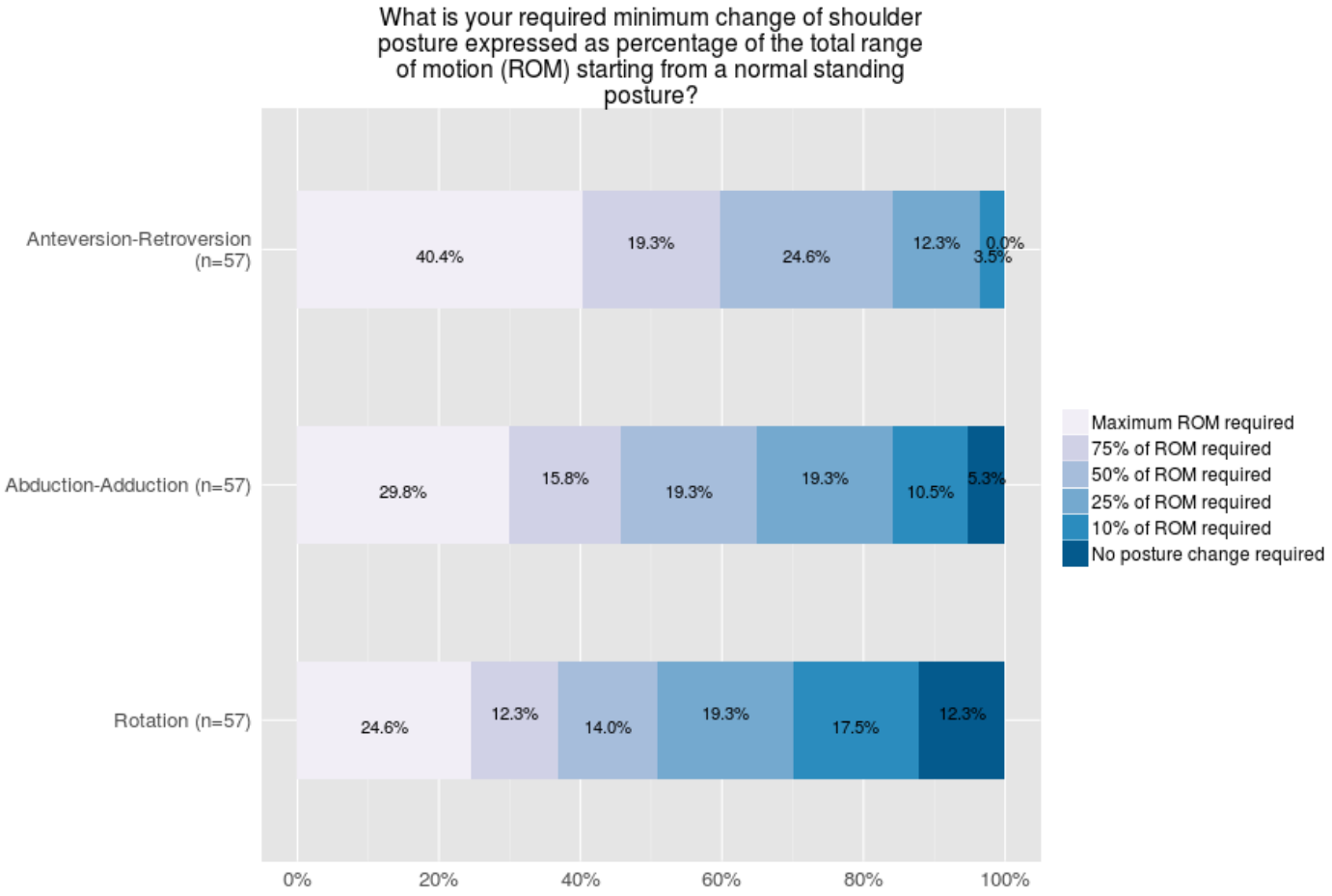


7.6 What is your required minimum change of shoulder posture expressed as percentage of the total range of motion (ROM) starting from a normal standing posture?

	No posture change required	10% of ROM required	25% of ROM required	50% of ROM required	75% of ROM required	Maximum ROM required	No answer
Flexion-Extension							
Abduction-Adduction							
Rotation							

Range of motion (ROM) is the movement of a joint from one extrem position to the opposite extrem position.

7.6.1 Result

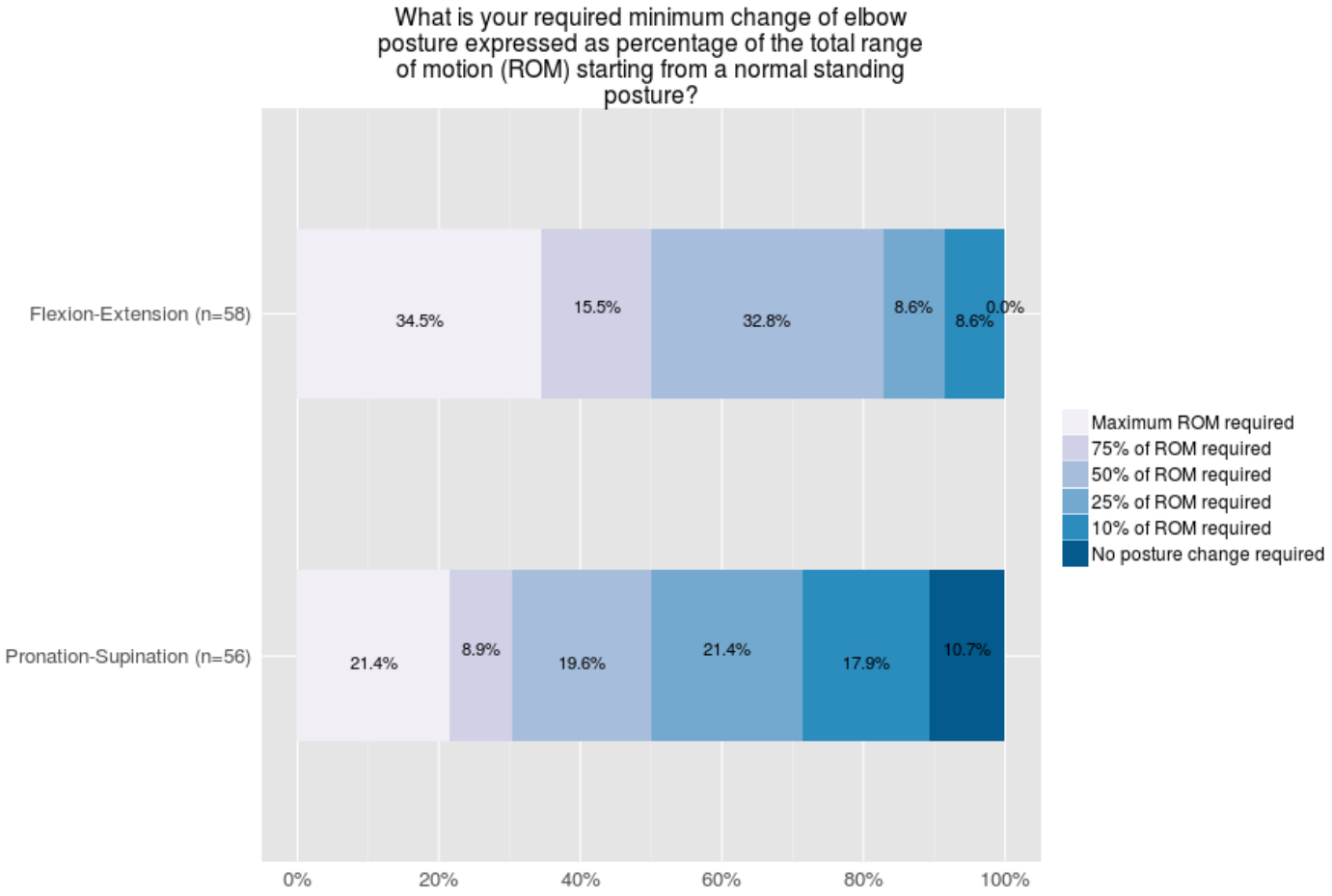


7.7 What is your required minimum change of elbow posture expressed as percentage of the total range of motion (ROM) starting from a normal standing posture?

	No posture change required	10% of ROM required	25% of ROM required	50% of ROM required	75% of ROM required	Maximum ROM required	No answer
Flexion-Extension							
Pronation-Supination							

Range of motion (ROM) is the movement of a joint from one extrem position to the opposite extrem position.

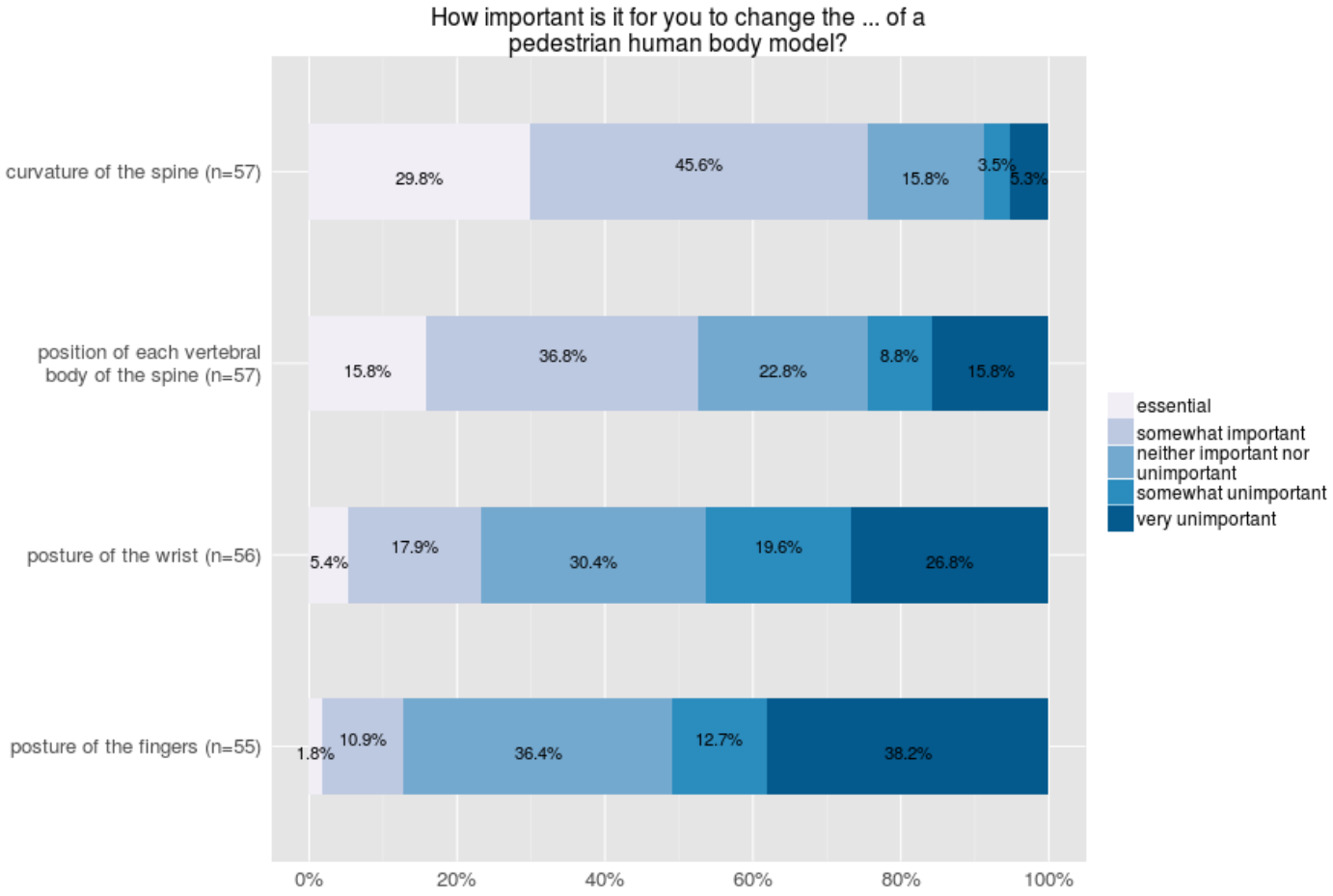
7.7.1 Result



7.8 How important is it for you to change the … of a pedestrian human body model?

	essential	somewhat important	neither important nor unimportant	somewhat unimportant	very unimportant	No answer
curvature of the spine						
position of each vertebral body of the spine						
posture of the wrist						
posture of the fingers						

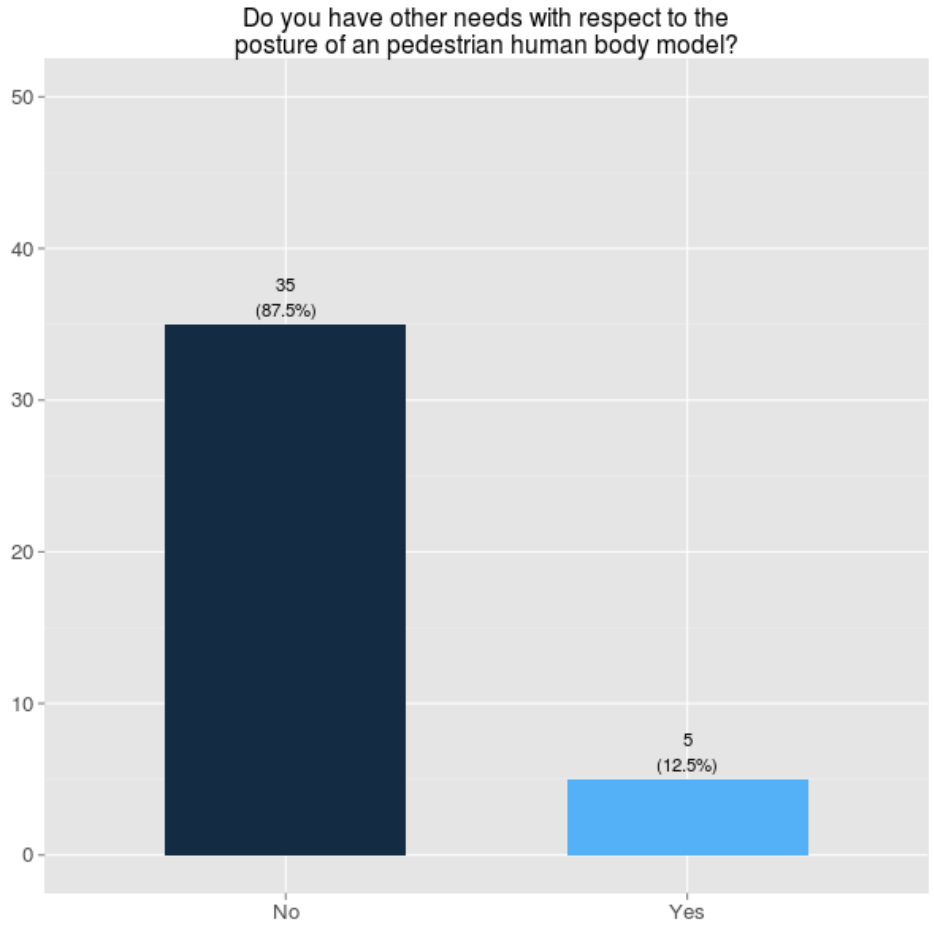
7.8.1 Results



7.9 Do you have other needs with respect to the posture of an pedestrian human body model?

Choose one of the following answers
[ ] No
[ ] Yes: […..]
[ ] No answer

7.9.1 Result



Other needs with respect to the posture of an pedestrian human body model:

```
shoulder shrugging, maximum ROM (PMHS with hanging shoulders), don't use one,
good mesh quality, definition of standard step postures (gaits),
Muscle activation in each position
```

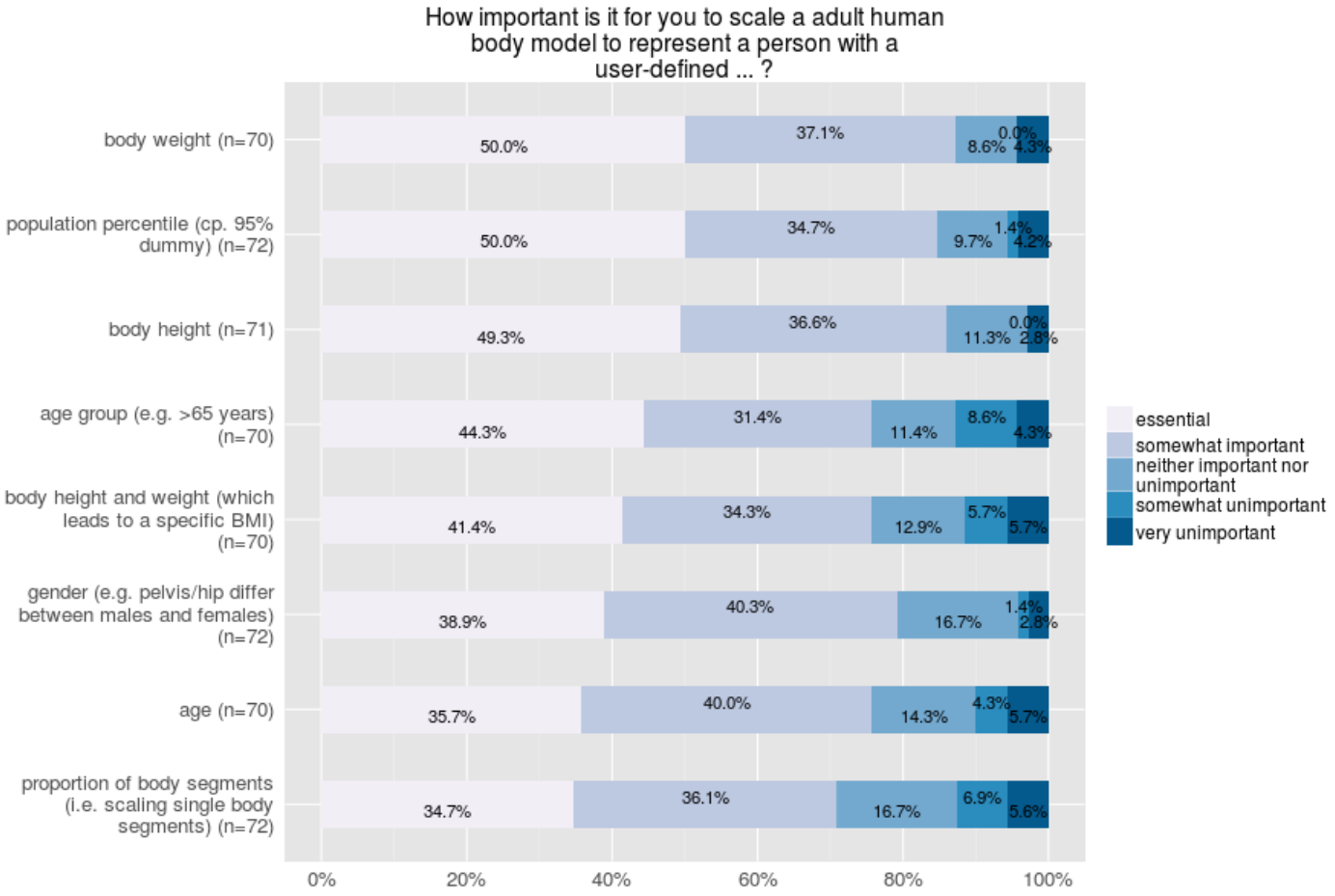
8 Scaling (personalizing) adult human body models

Note: If you currently don't use a adult human body model please answer the questions as if you would use one.

8.1 How important is it for you to scale a adult human body model to represent a person with a user-defined … ?

	essential	somewhat important	neither important nor unimportant	somewhat unimportant	very important	No answer
population percentile (cp. 95% dummy)						
body height						
body weight						
body height and weight (which leads to a specific BMI)						
age						
age group (e.g. >65 years)						
gender (e.g. pelvis/hip differ between males and females)						
proportion of body segments (i.e. scaling single body segments)						

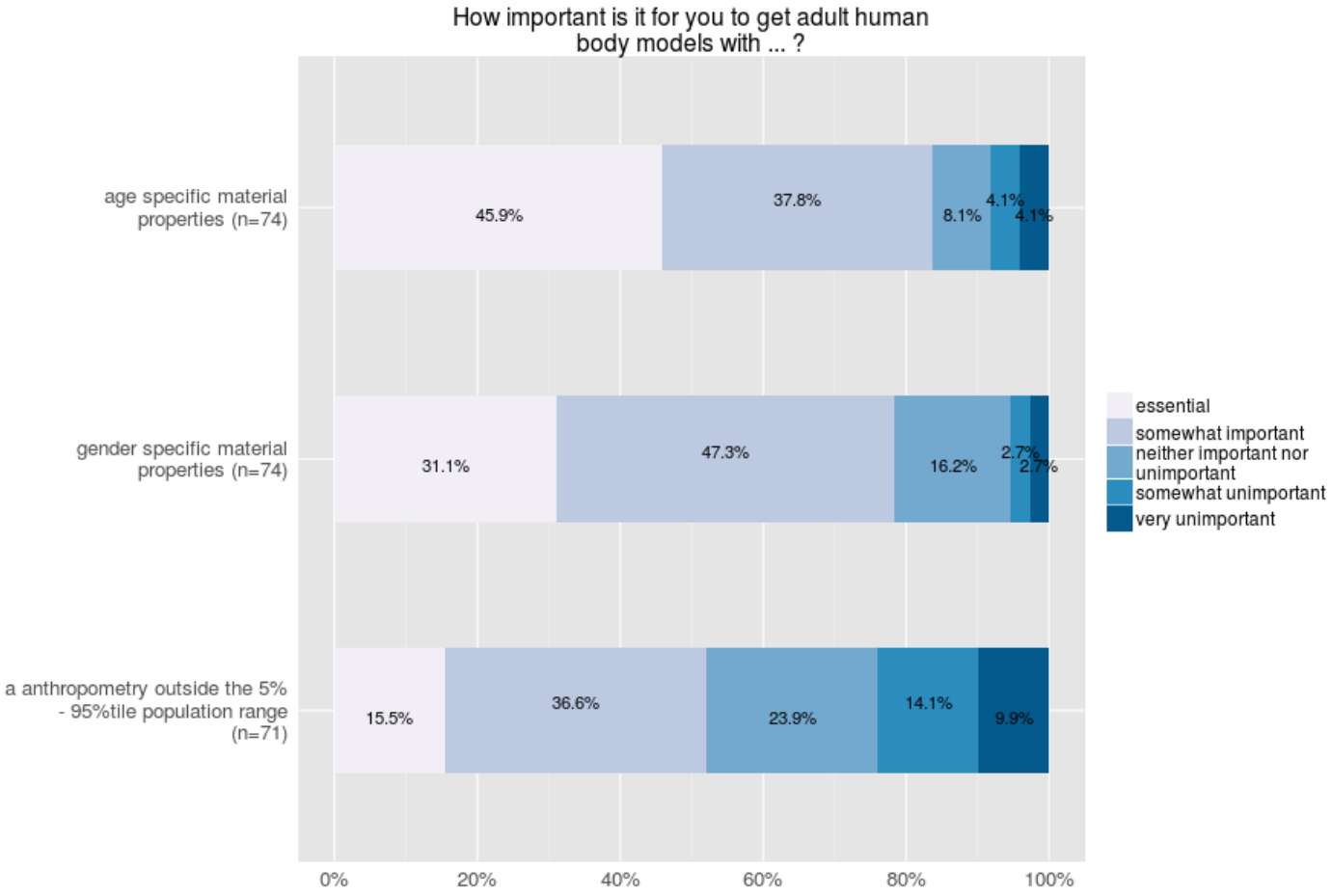
8.1.1 Results



8.2 How important is it for you to get adult human body models with … ?

	essential	somewhat important	neither important nor unimportant	somewhat unimportant	very important	No answer
a anthropometry outside the 5% - 95%tile population range						
age specific material properties						
gender specific material properties						

8.2.1 Results

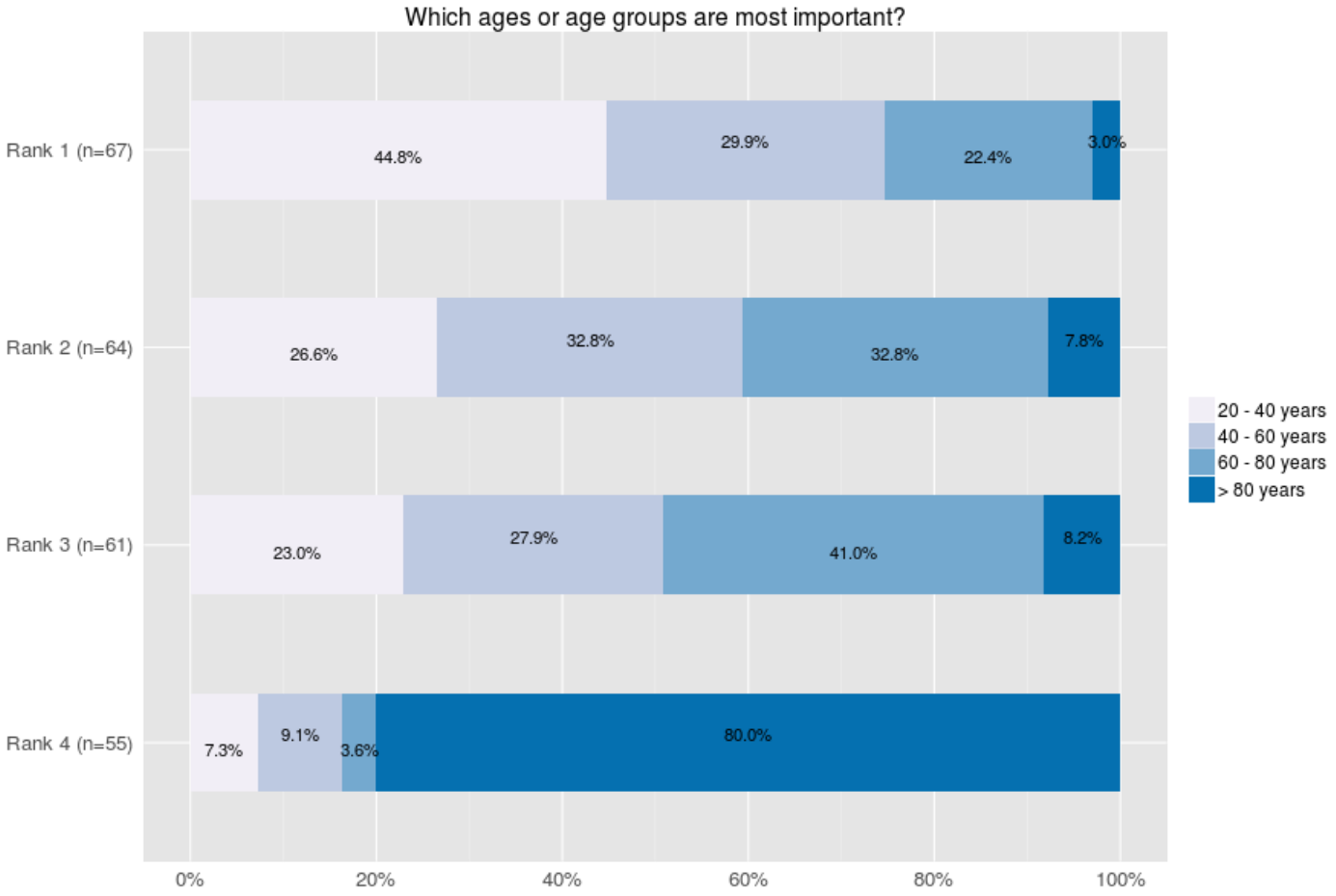


8.3 Which ages or age groups are most important

Double-click or drag-and-drop items in the left list to move them to the right - your highest ranking item should be on the top right, moving through to your lowest ranking item.

Your choices	Your ranking
20-40 years	
40-60 years	
60-80 years	
>80 years	

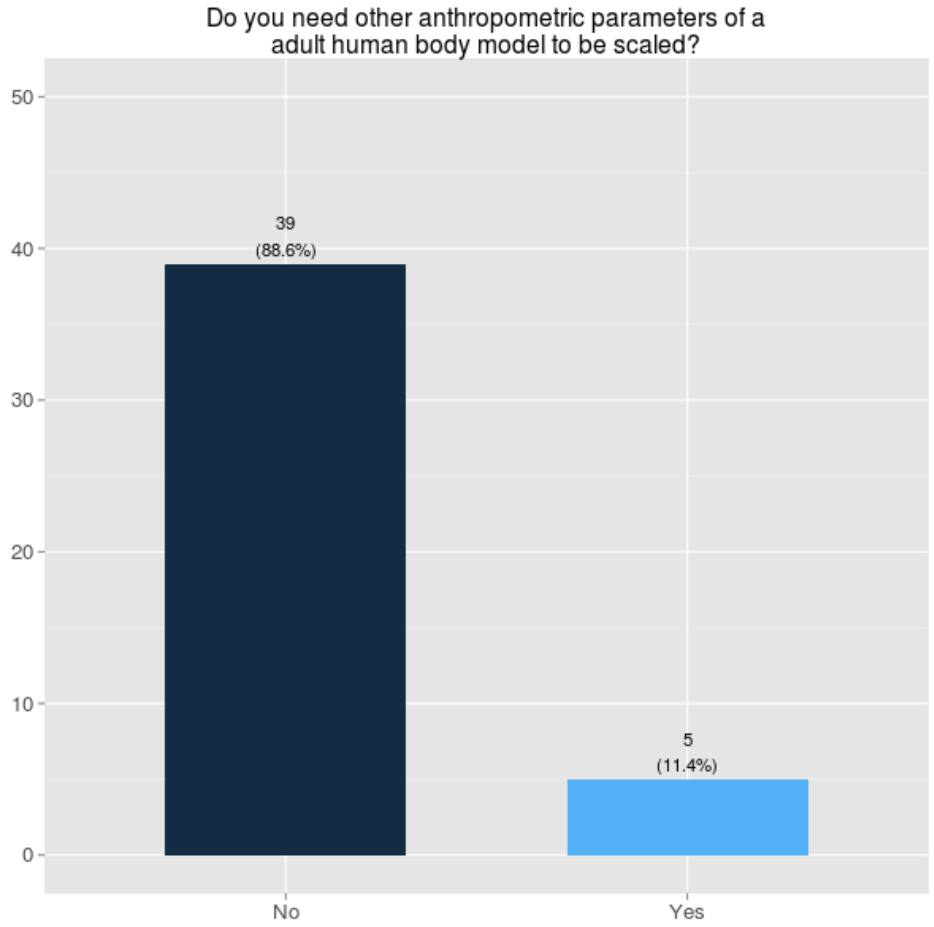
8.3.1 Results



8.4 Do you need other anthropometric parameters of a adult human body model to be scaled?

Choose one of the following answers
[ ] No
[ ] Yes: […..]
[ ] No answer

8.4.1 Result



Other anthropometric parameters of a adult human body model to be scaled:

```
brain size, thickness of muscles and fat in each body region,
Region specific anthropometric variables
```

9 Human body models representing children

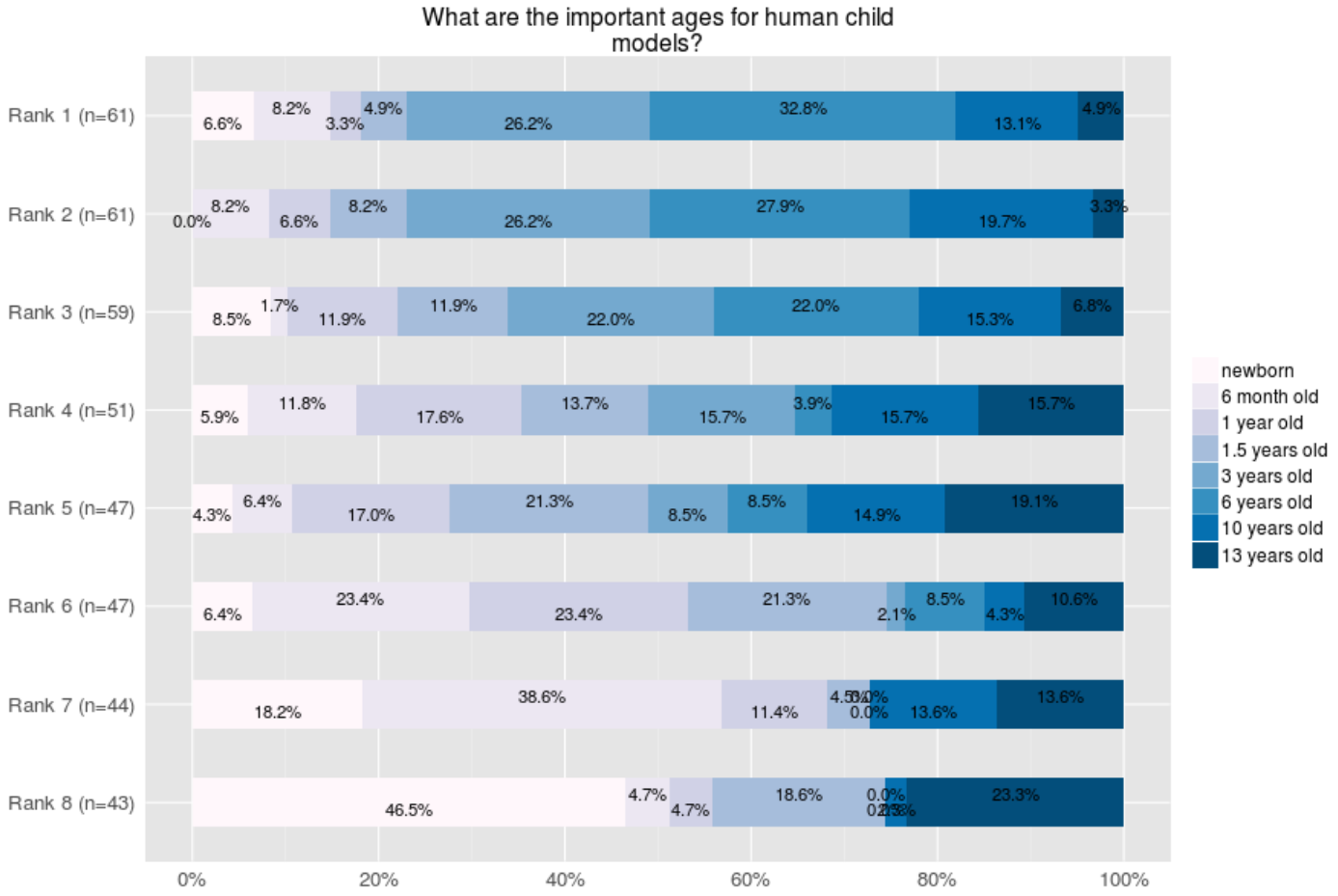
Note: If you currently don't use a human child model please answer the questions as if you would use

9.1 What are the important ages for human child models?

Double-click or drag-and-drop items in the left list to move them to the right - your highest ranking item should be on the top right, moving through to your lowest ranking item.

Your choices	Your ranking
newborn	
6 month old	
1 year old	
1.5 years old	
3 years old	
6 years old	
10 years old	
13 years old	

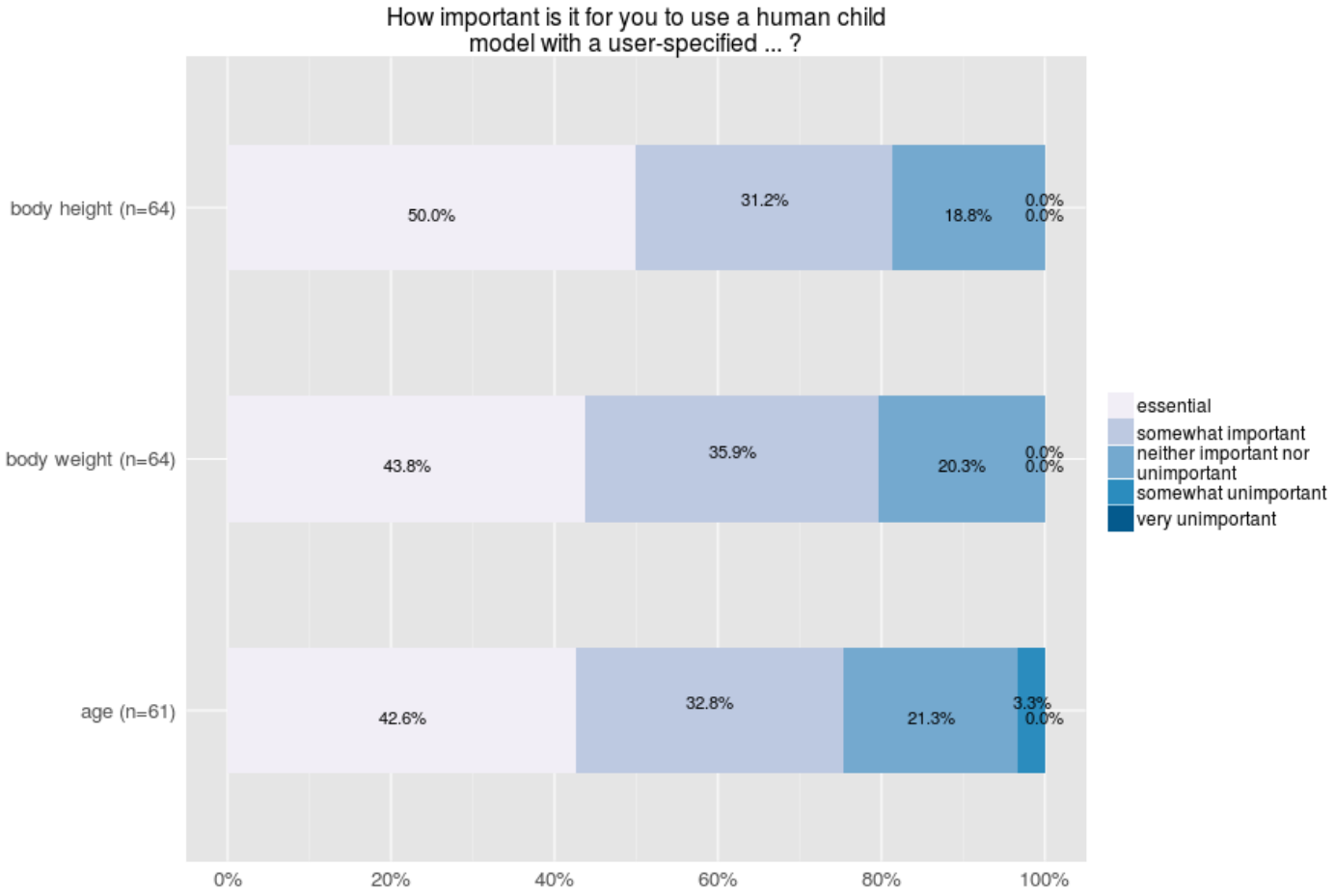
9.1.1 Results



9.2 How important is it for you to use a human child model with a user-specified … ?

	essential	somewhat important	neither important nor unimportant	somewhat unimportant	very unimportant	No answer
body height						
body weight						
age						

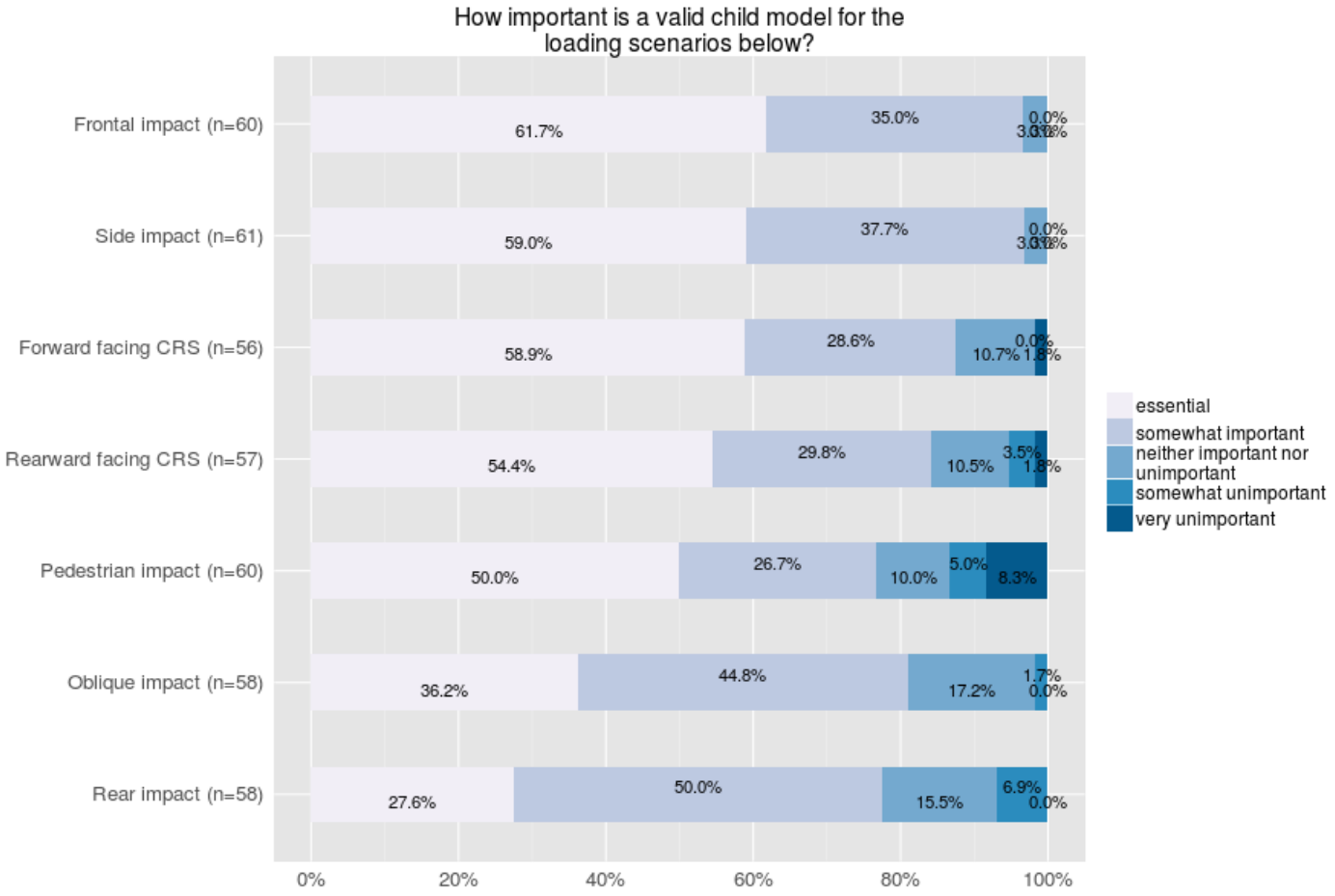
9.2.1 Results



9.3 How important is a valid child model for the loading scenarios below

	essential	somewhat important	neither important nor unimportant	somewhat unimportant	very unimportant	No answer
Frontal impact						
Side impact						
Rear impact						
Oblique impact						
Forward facing CRS						
Rearward facing CRS						
Pedestrian impact						

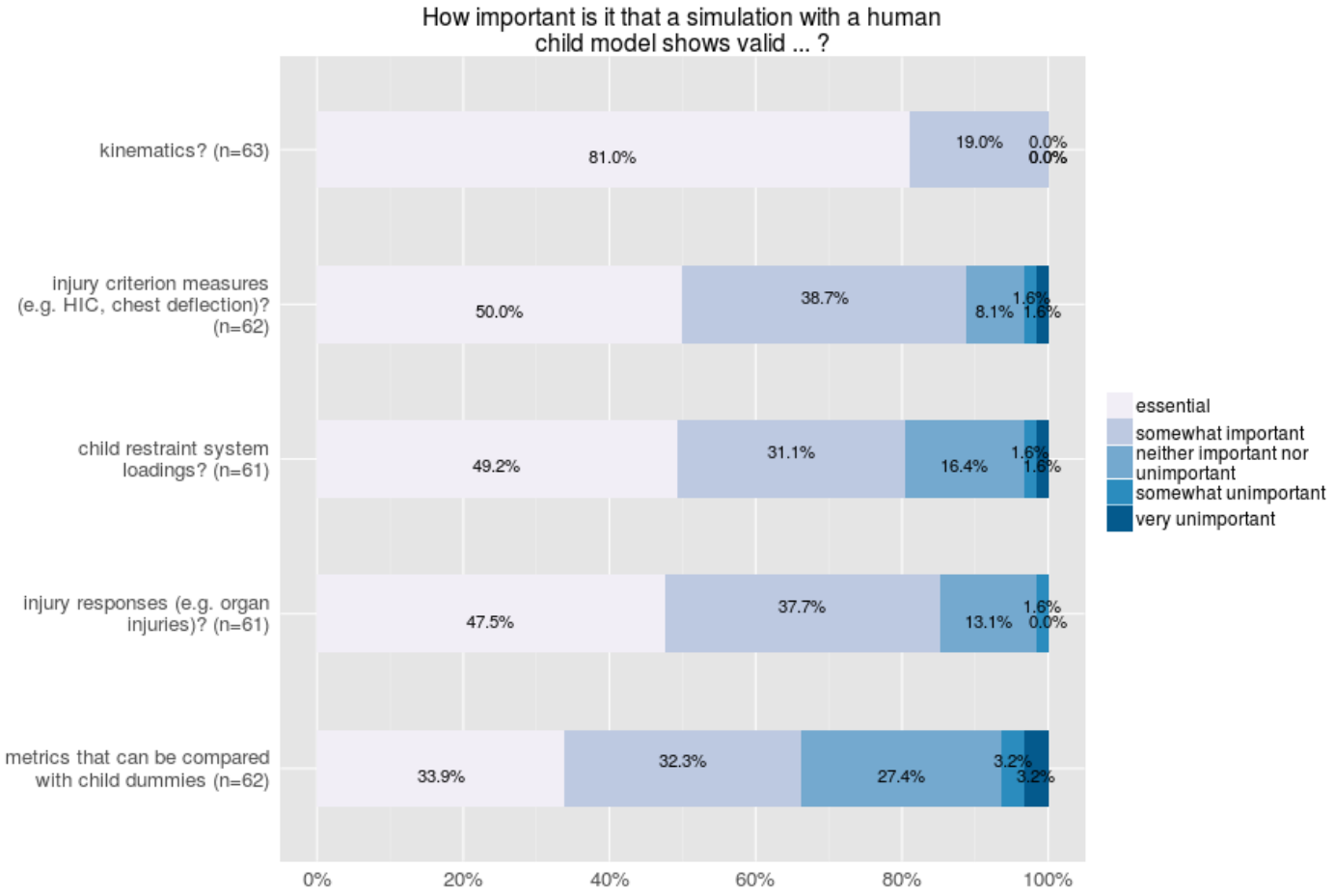
9.3.1 Results



9.4 How important is it that a simulation with a human child model shows valid … ?

	essential	somewhat important	neither important nor unimportant	somewhat unimportant	very unimportant	No answer
kinematics?						
injury responses (e.g. organ injuries)?						
injury criterion measures (e.g. HIC, chest deflection)?						
metrics that can be compared with child dummies						
child restraint system loadings?						

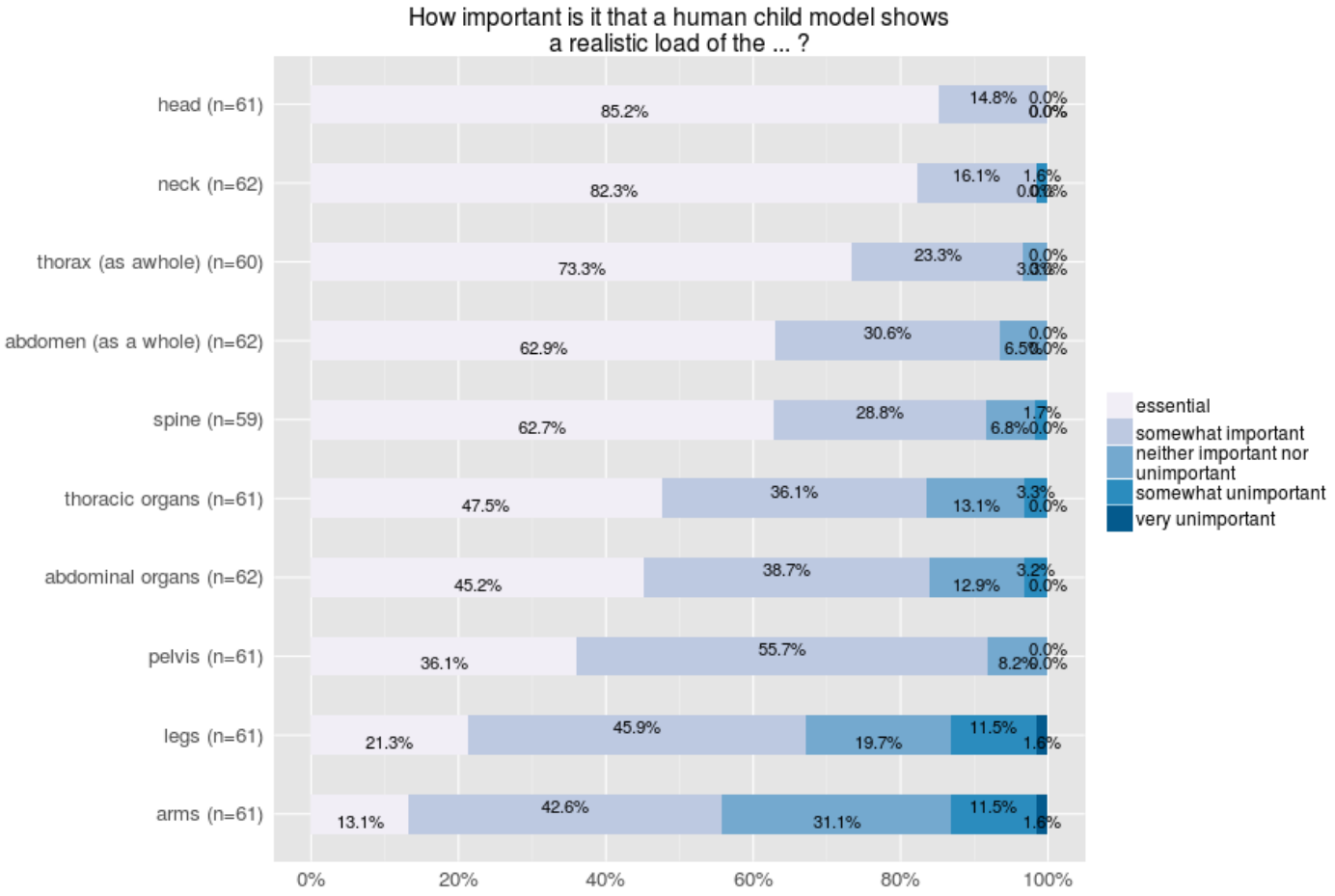
9.4.1 Results



9.5 How important is it that a human child model shows a realistic load of the … ?

	essential	somewhat important	neither important nor unimportant	somewhat unimportant	very unimportant	No answer
head						
neck						
spine						
thorax (as awhole)						
abdomen (as a whole)						
pelvis						
arms						
legs						
thoracic organs						
abdominal organs						

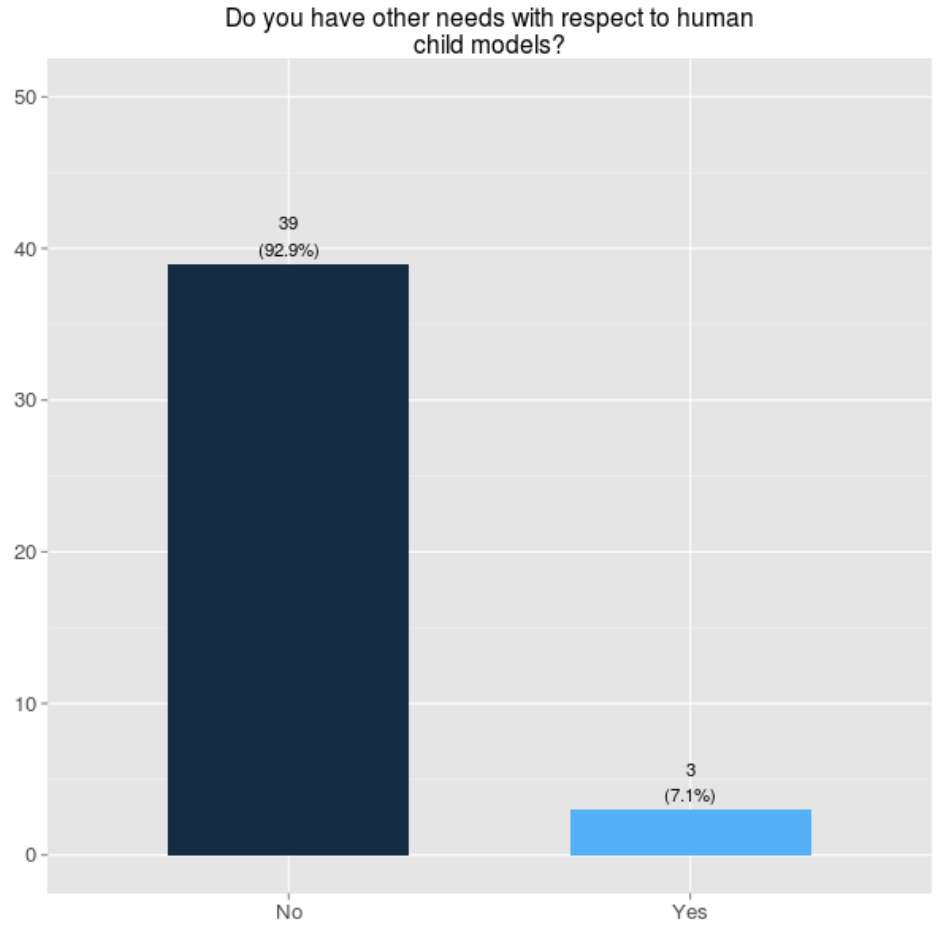
9.5.1 Results



9.6 Do you have other needs with respect to human child models?

Choose one of the following answers
[ ] No
[ ] Yes: […..]
[ ] No answer

9.6.1 Result



Other needs with respect to human child models:

```
brain size, thickness of muscles and fat in each body region,
Region specific anthropometric variables
```

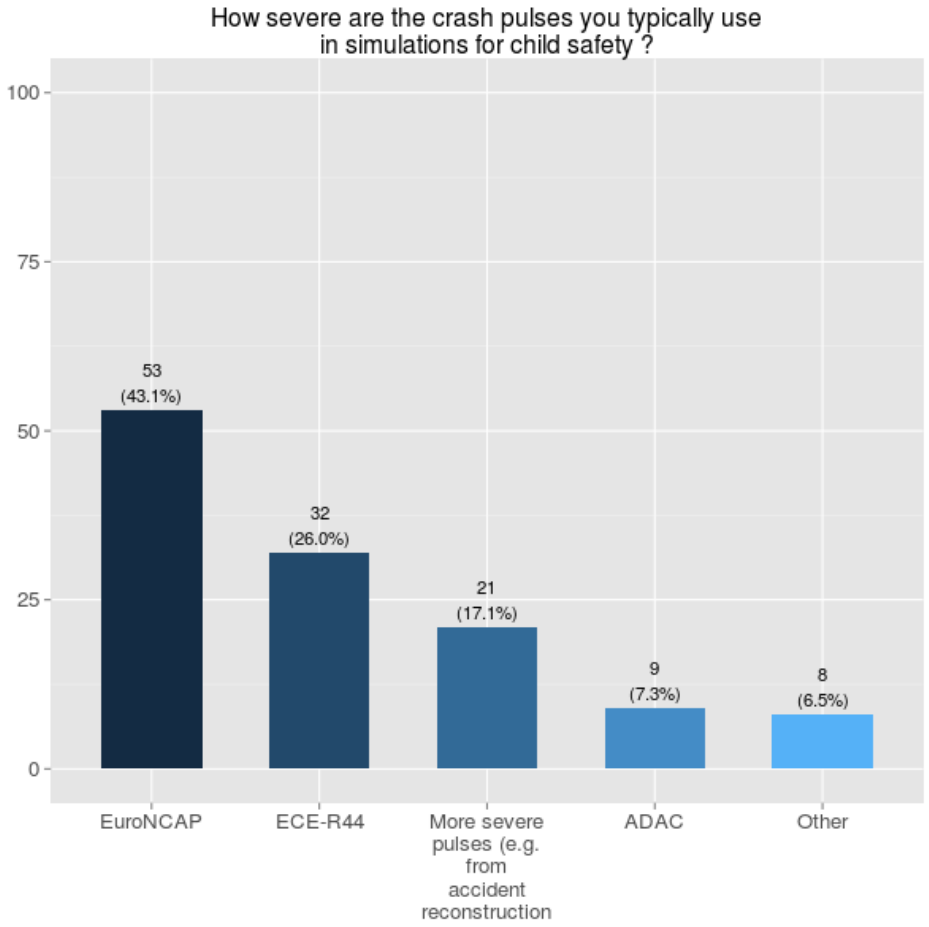
10 Application of human child models

Note: If you currently don't use a human child model please answer the questions as if you would use one.

10.1 How severe are the crash pulses you typically use in simulations for child safety ?

Check any that apply
[ ] ECE-R44
[ ] EuroNCAP
[ ] ADAC
[ ] more severe pulses (e.g. from accident reconstruction)
[ ] Other: […..]

10.1.1 Results



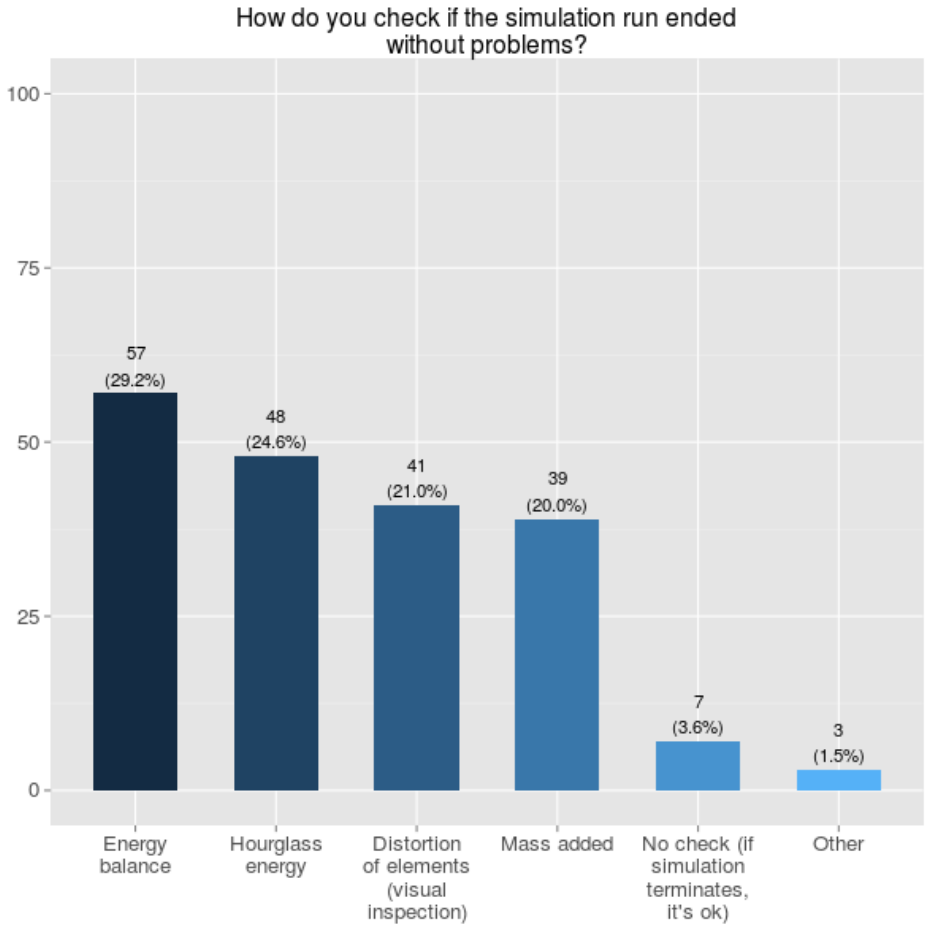
Other crash pulses used in simulations for child safety:

```
NCAP, FMVSS 213, USNCAP, NHTSA frontal offset oblique, FMVSS213, FMVSS 213,
AS1754, FMVSS213, FMVSS213(US)
```

10.2 How do you check if the simulation run ended without problems?

Check any that apply
[ ] Energy balance
[ ] Hourglass energy
[ ] Distortion of elements (visual inspection)
[ ] Mass added
[ ] No check (if simulation terminates, it's ok)
[ ] Other: […..]

10.2.1 Results



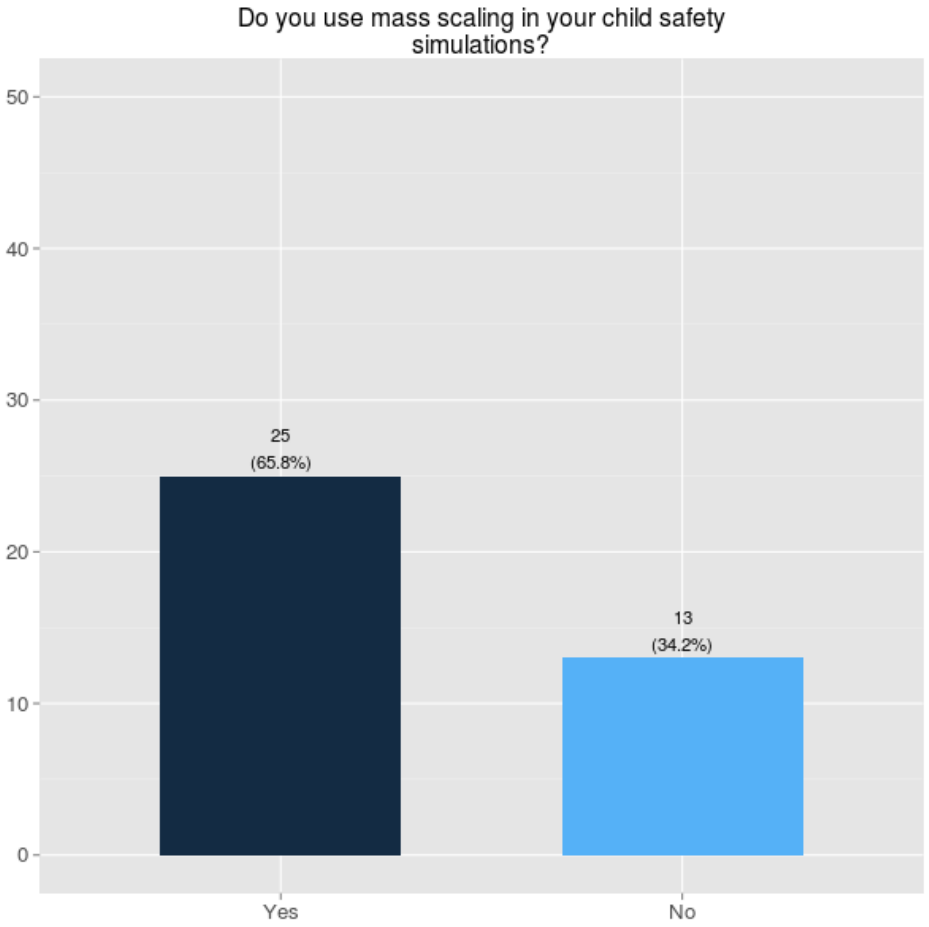
Other checks if the simulation run ended without problems:

```
contacts (visual inspection), Visual inspection, Makes sense
```

10.3 Do you use mass scaling in your child safety simulations?

[ ] Yes
[ ] No
[ ] No answer

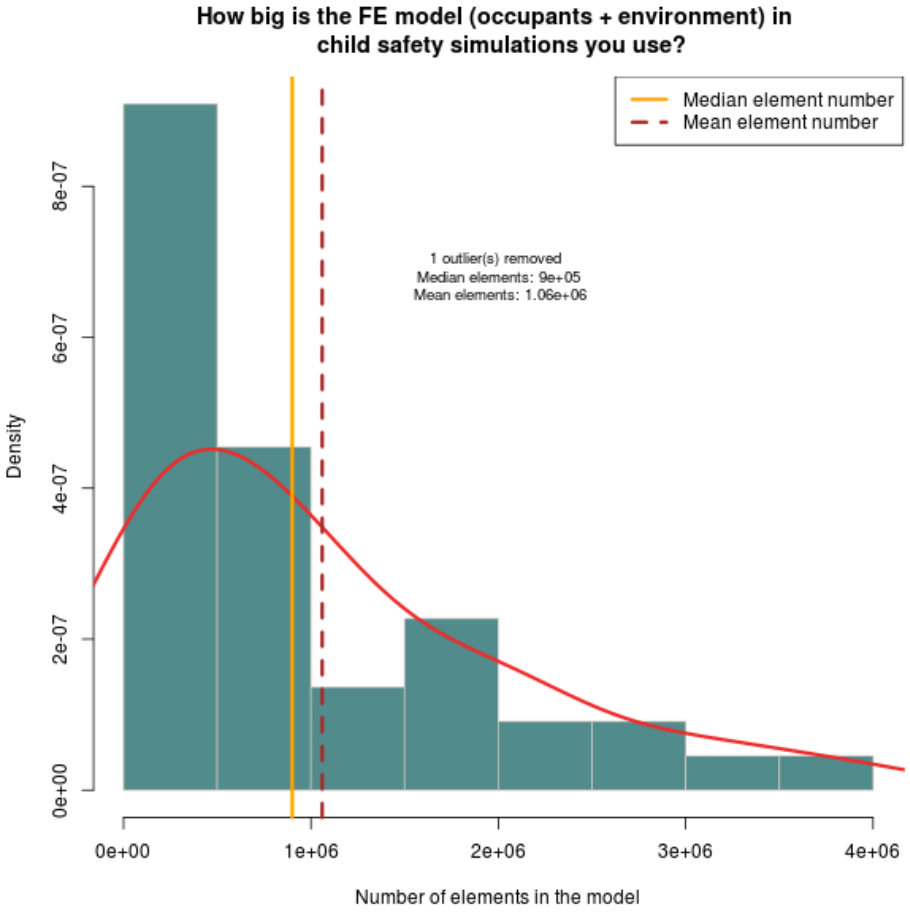
10.3.1 Results



10.4 How big is the FE model (occupants + environment) in child safety simulations you use?

Only numbers may be entered in this field.
[…..] elements
A rough estimate of the total number of elements in your simulation run is sufficient

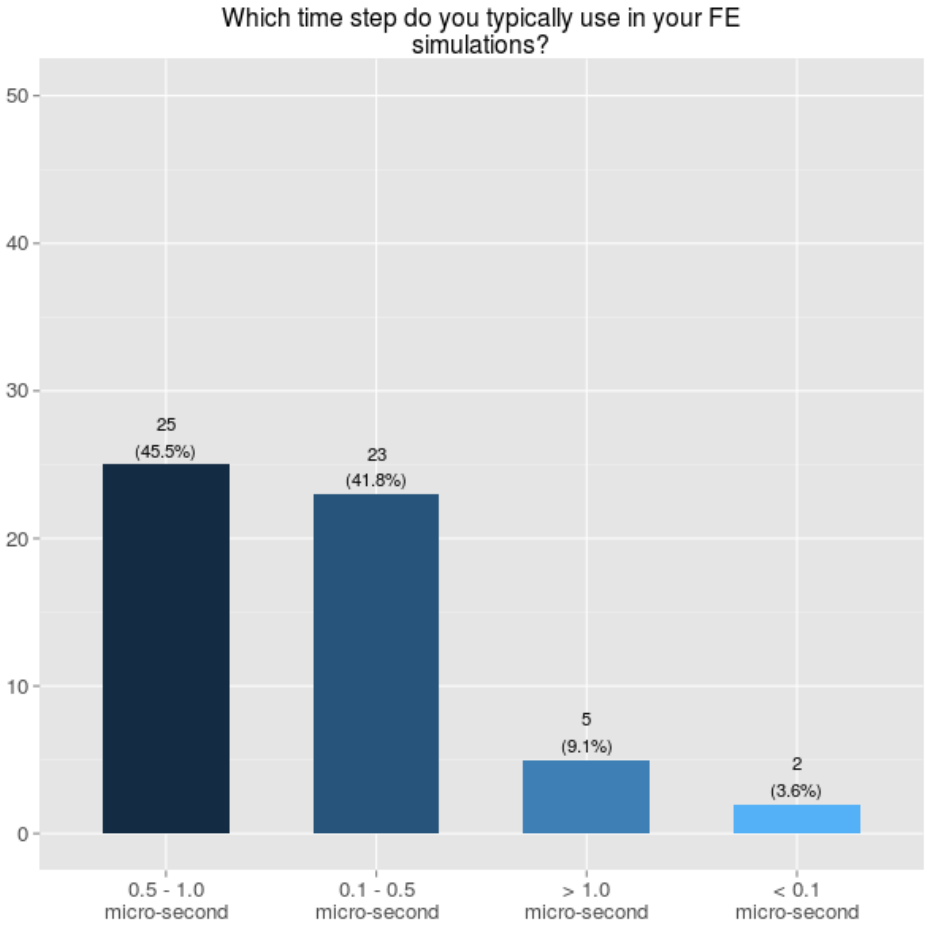
10.4.1 Results



10.5 Which time step do you typically use in your FE simulations?

Choose one of the following answers
[ ] < 0.1 micro-second
[ ] 0.1 - 0.5 micro-second
[ ] 0.5 - 1.0 micro-second
[ ] > 1.0 micro-second
[ ] No answer

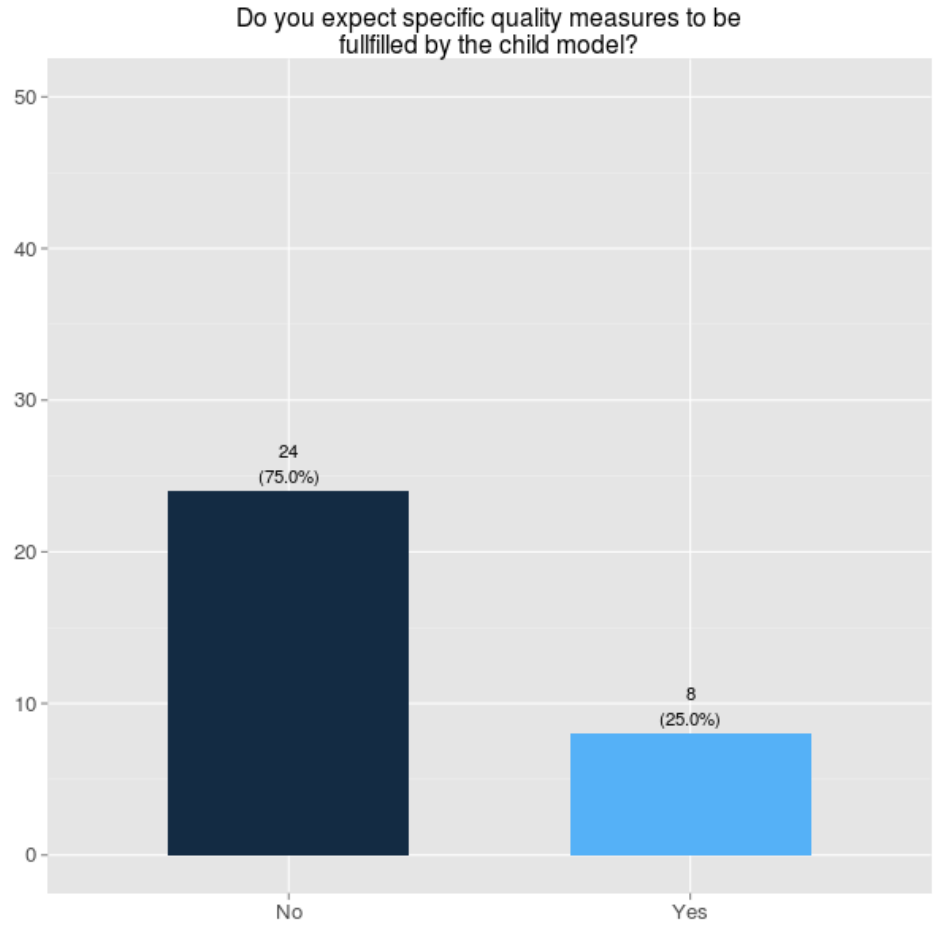
10.5.1 Results



10.6 Do you expect specific quality measures to be fullfilled by the child model?

Choose one of the following answers
[ ] No
[ ] Yes: [.....]
[ ] No answer

10.6.1 Result



Other specific quality measures to be fullfilled by the child model:

```
Stability against belt loading in crash, numerical stability,
Material Behavior Error
```

Date: 2014-10-24 10:13:56 CEST

Author: Norbert Praxl (PDB)

Org version 7.8.02 with Emacs version 24

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