INTRODUCTION

- International BCI Meeting attendance has grown from 22 research labs in 1999 to 188 labs in 2016, likely reflecting a growth in collaborating disciplines [1].
- Diversity in clinical backgrounds working with people with disabilities (PWD) may contribute to changes in recruited study participants and variations in how study participants are described.

OBJECTIVE: Report on trends regarding intended end-users, study participants, and descriptions of participant diagnoses and functional impairments.

Method:
- Rating tool developed to characterize elements of studies (see Rating Criteria below).
- Only abstracts describing participants controlling a BCI system were included.
- International BCI Meeting abstracts rated:
  - (n=20 of 22) 1999 First Meeting
  - (n=72 of 120) 2005 Third Meeting
  - (n=179 of 185) 2013 Fifth Meeting

INTERRATER AGREEMENT:
- Abstracts divided equally and randomly assigned to two trained raters
- 25% of abstracts for each Meeting are randomly assigned for double-entry
- Interrater agreement assessed, revisions made if necessary, process is reiterated for each year

Discussion

PWD Participation:
- This study reveals a decline in percentage of abstracts reporting PWD participation from 1999 to 2013.
- BCI performance for controls does not always predict performance with end-users. [3]
- Critical that PWD are involved in BCI research.

Description of participants who are PWD:
- Despite growing variety of diagnoses reported, there is a decline in the percentage of abstracts that received a specific rating for diagnosis description.
- May compel new guidelines for BCI Meeting submissions.

Results

- About 1/3 (1999: 32%, 2013: 40%) did not specify intended end-users.
- Controls were the most common study participant (1999: 12 or 60%, 2013: 122 or 68%).
- Decreased percentage of abstracts that provided specific participant diagnosis (e.g. ALS onset type, lesion location): 43% (1999) to 27% (2013). (Figure 3)
- Increased percentage of abstracts that provided description with specific level of impairment: 28% (1999) to 37% (2013). (Figure 4)
- Increase in number of different diagnoses reported among PWD study participants from 1999 (7 diagnoses) to 2013 (16 diagnoses). (Figure 5)
- The majority of participant impairments were physical each year (i.e., not sensory, cognitive, speech/language, consciousness)

Table: Participant Disabilies by Meeting Year

| Year   | Amyotrophic lateral sclerosis | Amputation | Brain injury | Brainstem stroke/lesion | Cerebral palsy | Disuse atrophy | Locked-in syndrome | Malignant brain tumor E. g. BC | Muscular dystrophy | Neurodegenerative disorder Unspecified | Paralysis/paresis | Progressive supranuclear palsy | Post-polio syndrome | Spinal cord injury | Spinal muscular atrophy | Spina bifida/Myelomeningocele | Stroke |
|--------|-----------------------------|------------|-------------|------------------------|---------------|----------------|-------------------|-------------------------------|------------------|------------------------------------|-----------------|--------------------------|-------------------|------------------|------------------------|-------------------|
| 1999   |                             |            |             |                        |               |                |                   |                               |                  |                                    |                  |                          |                    |                  |                        |                    |
| 2002   |                             |            |             |                        |               |                |                   |                               |                  |                                    |                  |                          |                    |                  |                        |                    |
| 2005   |                             |            |             |                        |               |                |                   |                               |                  |                                    |                  |                          |                    |                  |                        |                    |
| 2011   |                             |            |             |                        |               |                |                   |                               |                  |                                    |                  |                          |                    |                  |                        |                    |